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RAILWAY GAZETTE**

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INCORPORATING

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A Good L.M.S. "Quota" Year

BEHIND the inter-district rivalry of the L.M.S.R. Quota League competition there is the common purpose of bringing the volume of traffic handled back to the level of 1929. The March issue of *Quota News* summarises the results of the past year, and in surveying the activities of his department over that period, Mr. Ashton Davies, the Chief Commercial Manager, is able to record a further advance towards the objective. Passenger business attained 88 per cent. of its 1929 value, goods 79.78 per cent., and minerals 85.83 per cent. A satisfactory feature of the 1935 figures is the number of districts apart from those topping the various tables which improved upon their quotas. For example, the winner of the England and Wales passenger competition was Barrow, with 101.95 per cent., but Sheffield, in the fourth place, was commendably close to the leaders with 100.13 per cent. In Scotland, Ayr won a double victory, heading the coal quota with 98.94 per cent. and the passenger league with 103.02 per cent. In the English and Welsh freight and coal competitions the first two places were in each case occupied by districts which had improved upon their quotas, the most noteworthy result being Northampton with 107.84 per cent. of its stipulated volume of freight business.

L.N.E.R. Meeting

At the London & North Eastern Railway meeting last Friday, Mr. Whitelaw called attention to the fact that the answers to many of the points raised by stockholders were contained in the annual review which had been sent to give them information before the meeting, so that they might frame their questions in view of that information. The Chairman explained why the company had not taken credit in the 1935 accounts for the expected savings on rates and rebates, by showing that an appeal to the Railway & Canal Commission against the valuation of the company's undertaking by the Railway Assessment Authority at nil was actually pending, and that it would not be prudent to speculate on what the decision of the Court was going to be. Passenger takings had been the most satisfactory feature of the past year's traffic, and he noted the increase of £49,000 from first class fares. Substantial improvement in the running times of a number of trains, including those in East Anglia, were promised for the coming summer. These improvements were the outcome of the steadily-pursued policy of strengthening the permanent way and bridges, of widening lines, and of increasing the power of locomotives. The new works contemplated under the Government assistance scheme would enable this policy to be still further developed, and were fully expected to increase net revenue.

* * *

The Week's Traffics

After the increase of £136,000 in the traffics of the four main line companies for the previous week, the corresponding increase of only £41,000 for the past week is on the whole disappointing. The percentage increases in the aggregate receipts to date of the individual companies are lower except on the L.M.S.R. For the four companies together the receipts for the ten weeks amount in all to £27,019,000, an increase of £724,000, or 2.75 per cent., which contrasts with 2.89 per cent. a week ago. Passenger train traffics of the four companies to date show a net increase of £54,000, towards which the Southern contributes £41,000. In merchandise receipts for the same period the net gain is £229,000, towards which the L.M.S.R. contributes £134,000. All the companies share in the advance of £441,000 in coal class earnings, the L.M.S. and L.N.E. Companies being together responsible for £345,000 of this amount.

	10th Week					Year to date	
	Pass.	&c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	%
L.M.S.R.	1,000	25,000	8,000	34,000	326,000	3,000	3.05
L.N.E.R.	3,000	9,000	2,000	4,000	238,000	2,99	
G.W.R.	3,000	6,000	4,000	7,000	105,000	2.39	
S.R.	1,000	3,500	1,500	4,000	55,000	1.69	

On the Great Northern Railway (Ireland) the increase to date is £6,500, made up of £2,800 from passengers and £3,700 from goods.

* * *

Glasgow City & District Railway

Just 50 years ago the first of the steam-operated underground railways serving the centre parts of Glasgow was brought into service in order to relieve the ever-growing congestion of the Queen Street, Glasgow, terminus of the North British Railway. The scheme was introduced in 1882 for joining up the Stobcross branch with the Glasgow and Coatbridge branch by means of an underground line passing under Queen Street terminus, and there constructing a low-level station. A separate company—the Glasgow City & District Railway Company—was incorporated by Act of August 10, 1882, to build the line, and a working agreement was entered into with the North British Railway. The railway was opened on March 15, 1886, and in the following year was acquired by the North British

company. It extends from Stobcross junction to College junction and has three intermediate stations. It is noteworthy that a system of automatic electric lighting of trains—one of the earliest instances in this country—was adopted on this line. The system was known as Carswell's patent, and each carriage had its own contact-maker to a live rail in the 4-ft. way. Beyond each end of the tunnel this third rail was ramped down and stopped, so that the lights in the carriages became automatically lighted or extinguished as the train passed on or off the section where this rail was in contact.

* * *

Overseas Railway Traffics

The increases in Argentine railway traffics during the past fortnight have not been remarkable, and in the same period the Buenos Ayres Great Southern records a further decrease of £81,341. Traffics have to some extent been affected by the incidence of the Carnival holidays. The three British-owned Brazilian railway companies record material increases in currency for the year to date, but whereas in the first ten weeks the Great Western has a decrease in sterling of £11,100, the Leopoldina shows an increase of £9,463. For the past week the milreis at the free market rate averaged 2.75d., compared with an average of 3.19d. a year ago. The San Paulo in the first nine weeks shows an improvement of £39,174.

	No. of Week	Weekly Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
Buenos Ayres & Pacific	36th	100,940	+ 5,668	2,898,044	+ 262,365
Buenos Ayres Great Southern	36th	163,102	- 25,787	4,661,320	- 426,036
Buenos Ayres Western	36th	48,414	- 49	1,586,218	+ 16,029
Central Argentine	36th	110,329	+ 701	4,359,970	+ 120,995
Canadian Pacific	9th	545,000	+ 115,400	3,720,800	+ 336,200
Bombay Baroda & Central India	48th	252,150	+ 53,775	7,528,350	- 41,250

The latest traffic increase of the Canadian Pacific brings its aggregate gain for the year to date to £336,200.

* * *

"On Time" Service Appreciated

Through the columns of *On Time*, the Operating Department of the L.M.S.R. has received an interesting tribute from a traveller by the Blackpool and Fylde Coast Express, whose list of the things that pleased him in the running of the train and its appointments is worthy of general study. In the forefront is placed the fact that, despite adverse weather conditions, time was kept throughout, but equal importance is attached to the comfortable warmth (coupled, we suppose, with breathable atmosphere) of the coaches, and the absence of perceptible motion. The most significant point in the letter, however, is the writer's remark that he was sorry when the time came to get out, to which attitude something more than physical comfort must have contributed. The demeanour of the railway servants with whom the traveller came in contact from the moment of buying to that of giving up his ticket had no doubt an unsuspected influence. The interior decoration of the coaches may not have been actively noticed, but if it had forced itself upon the attention by being conceived in poor taste, less regret would have been felt in leaving it. Lastly, perhaps, the traveller enjoyed the subconscious knowledge that for his modest fare the services of the whole organisation visible from the carriage windows were undividedly enlisted on his behalf.

* * *

An American Railway Centenary

A reminder that the United States experienced in 1837 a similar railway slump to that in Great Britain is given by the story of the Galena & Chicago Union Railroad, which was outlined recently in the *Railway Age* on the occasion of the centenary of the company. This railroad, which was the first in Chicago, and the first to con-

nect that city with the west, was incorporated in Illinois on January 16, 1836, with "authority to build a railroad out into the prairie country and on towards, if not to, the Mississippi river, near the lead mines of Dubuque, Iowa, and Galena, Ill." One peculiarity of the charter was that the directors were authorised to build a turnpike road on any portion of the route of the railroad, with toll gates if they deemed it necessary. When sleighs were used in the winter, the toll was to be half the summer charge. Surveys were made by James Seymour from the foot of North Dearborn street as far as the Des-Plaines river, but the financial panic of 1837 put a stop to the construction of this and many other roads in the United States, and there was a delay of ten years. Then, in September, 1847, the survey was taken in hand, at a salary of \$2.50 a day, by Richard P. Morgan. At first strap rail (iron strips on longitudinal wooden baulks) was used between Chicago and the Des-Plaines river. On October 24, 1848, the *Pioneer*, the first locomotive to run on any railroad out of Chicago, was placed on this line; it had been brought to Chicago by boat from the east. The railroad was merged with the Chicago & North Western in June, 1864.

* * *

The Dalnaspidal Level Crossing Accident

The collision of August 27 last between an express passenger train, running at 45-50 m.p.h., and a stationary private motorcar, at Dalnaspidal occupation crossing over the main double line of the former Highland Railway, was at a point where rail traffic passes at from 29 trains each way in summer, to 24 up trains and 13 down trains in winter. The road traffic is mainly for Dalnaspidal shooting lodge, now occupied by Balfour, Beatty & Company, the contractors for the Grampian electricity scheme, but all plant and stores for that work are dealt with at a private siding at the station. The road user at the time of the accident was estimated at 8 to 12 motor vehicles daily in each direction, but had previously been heavier. The car which met with the accident was owned by an apprentice engineer, 19 years of age, whose previous unaccompanied driving experience had been in private grounds. The collision occurred when he had alighted to open the down side gate, leaving the car standing on the up line. In this case the fixed signals cannot be of much guidance as to the approach of a train, as the up signals are at "clear" for 14-18 minutes for an express, and for half-an-hour for a goods train. Major Wilson therefore suggests that drivers of motor vehicles approaching from the up side when trains are signalled should be instructed by a notice board at the crossing either to proceed to the signal box and inquire whether it is safe to cross—this should not take more than six minutes for the journey both ways on foot—or to wait until the train has passed.

* * *

André Marie Ampère

Almost every week, it seems, the centenary occurs of some great scientist or engineer, or of the completion of a notable work. Despite the large number of celebrations—itself an indication of the tremendous commercial awakening of a hundred or so years ago—there are some names it would be improper to ignore, and among them is undoubtedly that of André Marie Ampère, the French physicist. He died at Marseilles on June 10, 1836, and already the French Minister of Posts and Telegraphs has taken the first step in commemorating his work in establishing the relations between electricity and magnetism, by issuing a 75-centime stamp bearing his likeness.

Ampère was born at Polémieux, near Lyons, on January 22, 1775, and thus his early years were overshadowed and disturbed by the French revolution. Mathematical studies were his great delight, and, when his father, a justice of the peace at Lyons, was awaiting execution in 1893 by the Convention, he wrote from prison "My greatest expense has been the purchase of books and geometrical instruments which our son requires for his education." On September 11, 1820, Ampère heard of H. C. Oersted's discovery that a magnetic needle could be deflected by a voltaic current. He presented to the Academy in the form of a paper on September 18 a far-reaching exposition of that and kindred phenomena, and his work was studied with admiration by Faraday, who in 1831 set the seal thereon by his discovery of electromagnetic induction. Ampère is, of course, one of the great names that have been perpetuated in the nomenclature of electrical units, and his also survives in a less apparent form in the ammeter, formerly called the amperemeter.

* * *

A Bugatti Long-Distance Record

Certain features of the Bugatti railcar record, which is described on page 537 of this issue, deserve special emphasis. One is the remarkable feat of running from Nancy to Châlons-sur-Marne, a distance of 112.0 miles, in 74 min. start-to-stop, which works out at an average of 90.8 m.p.h. Another is the remarkable rapidity with which the car showed itself capable of accelerating from rest, a speed of 87 m.p.h. being attained, for example, roughly 3 min. after leaving Nancy, and in a distance of not more than 3 miles. It was one of the smaller Bugatti petrol-driven units, of the ZZy type used on the Etat system, that was under test, and the overall time of 3 hr. 47 min. from Strasbourg to Paris on this experimental run showed a cut of 1 hr. 25 min. on the best timing of an ordinary steam-hauled *rapide*, even though the latter involves an average speed of exactly 60 m.p.h. for the entire distance of 311.7 miles from Strasbourg to Paris, covered in 5 hr. 12 min. The *rapide* makes one 5 min. stop, at Nancy; but the railcar stopped twice, at Nancy and Châlons, for a total of 12 min., so that the actual running time of the railcar was 3 hr. 35 min., and the average running speed throughout, including three severe and several minor slowings, was 87 m.p.h. Some 270 miles of the journey were covered at over 130 km. (80½ m.) p.h., and fully 240 km. (150 miles) at 150 km. (93 m.) p.h. and over, with a maximum of exactly 100 m.p.h.

* * *

A Welding Exhibition

Keen interest was evidenced in South Wales in the welding exhibition arranged on March 4 by Professor Bacon in the engineering department of Swansea University. Many leading firms, of national as well as local repute, participated. During the afternoon Mr. Ramsey Moon gave a lecture on "Welding in Structural Work," instancing many of the Continental railway bridges with which our readers have been made familiar by articles in our columns and those of our constituent *The Railway Engineer*. He said that German practice was further advanced than British engineers would go at present, but that educational work such as the exhibition would doubtless result in greater attention being paid to welding in Great Britain. Another lecture was given in the evening by Professor F. C. Lea, of Sheffield University, on "Some Researches on Welding," in which he showed that static testing gave less information than repetition-stress testing of the reliability of welding in service, and he referred to the work of the Welding Committee of the Institution of

Mechanical Engineers, and the new testing machines developed for large-scale specimens. Items in the exhibition included a number of railway interest, amongst others some excellent photographs of fabricated diesel electric locomotives, brake shafts, and of the throat plate of a large Pacific locomotive, besides many examples of repair work.

* * *

Welding on Australian Railways

The January issue of our Australian contemporary, *The Commonwealth Engineer*, contains an article on railway practice in Victoria in welding of rolling stock. Victorian railway engineers were quick to realise the advantages of welding, and early steps were taken to form and train the nucleus of a welding division. Complete freight wagons have since been fabricated by welding, and locomotive tender tanks and bogies for various vehicles are now also of all-welded construction. Latterly the practice has been extended to permanent way, the resultant long rails producing appreciable economy in track and rolling stock maintenance, as well as added comfort to railway travellers. Among the numerous examples of welded rolling stock details may be mentioned housings for the draft gear of locomotive tenders. Each of these housings weighs 7 cwt. and can be produced at £2 less than the cost of a steel casting, the result being a sounder job, whilst machining is, of course, disposed of. During the conversion of the goods stock to automatic coupling, arc welding was applied to great advantage. The cost of conversion was appreciably less, and the tare weight of the completed wagons reduced. A number of welded bogies have been built by the Victorian Railways for use on 60-ft. express mail passenger vans of 20 tons capacity, and 27-ton welded goods wagons were built experimentally to establish the effects on the construction of severe collisions. So encouraging were the results both under test and in service that 160 of these welded wagons were subsequently built.

* * *

American View of the L.M.S. Turbine Locomotive

In its February issue our American contemporary, the *Railway Mechanical Engineer*, published an illustrated description of the L.M.S.R. turbine express locomotive. After briefly reviewing the history of this class of construction to date, our contemporary goes on to say that at the present somewhat discouraging stage the mechanical officers of the most important and progressive of the British railways became convinced that the time had not yet arrived for pronouncing the turbo-locomotive a failure. They therefore attacked the problem of designing a turbo-locomotive which would be as simple as possible and yet permit the realisation of a large portion of the turbine's efficiency. The result of these efforts is the London Midland & Scottish engine, which, remarks our contemporary, is the railwayman's idea of a clean-cut locomotive with no more departure from good standard practice than was required to apply a turbine in the place of a reciprocating engine. In working out the design, however, the accumulated knowledge of an experienced firm of turbine and reduction gear manufacturers was utilised. The article comments upon the fact that the locomotive is non-condensing, easily and efficiently controlled, and has an extremely ingenious front-end arrangement which makes any resort to an exhaust fan unnecessary. In quoting the expected fuel economy of 15 per cent. the author remarks that if it is realised it will amount to a considerable reduction in operating expenditure in a country where the prevailing cost of coal may be taken as approximately \$4.25 (17s.) a ton.

A Remedy for PEP

A COUPLE of years ago an Engineers' Study Group on Economics was formed, apparently for the purpose of studying the cause of the poverty-amidst-plenty paradox. Unfortunately, to judge by its second interim report, the group seems to have strayed a little off the direct line of its objective. Nevertheless it has carried out a useful investigation which points to the justification of an immediate increase in purchasing power. The report mentions "a desirable family budget" of £6 a week (presumably as a minimum) for four persons, and produces evidence of its immediate possibility from the purely physical standpoint. Quite properly, no suggestion is made as to how such a proposition could be financed. That is a matter for financial experts; it is enough for those concerned with the realities to point to the result desired. Nevertheless financial arrangements ought to be demanded without delay, to enable consumers to buy the amount of goods and services shown to be available for them weekly. The only reason for money is that it should so accurately reflect facts as to facilitate the distribution of goods and services.

Obviously even such a small increase in consumer purchasing power as is shown by the Engineers' Study Group investigation to be justified, would stimulate demand in many directions, not least important in railway traffic. Indeed, here is the simple solution which would release for better work the ponderous labours of that painstaking group of gropers in the dark known, inappropriately enough, as PEP (Political and Economic Planning). That body has just issued a couple of pamphlets about the problem of transport—which is nothing but a problem of finding an output for its surplus capacity. PEP correctly states that the ultimate objective is to place at the disposal of the community, to the fullest possible extent, the transport facilities made available by science. Science has made that easy. The only thing that now remains is for the community to see that finance enables them to make use of what is available.

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Czechoslovak Railways in 1934

WE have received from the Czechoslovak State Railways Administration the latest complete report of its operations, covering the year 1934. The report is published in Czech, French, and English and contains a number of interesting details, not usually found in railway reports, and some of these are given on page 534 in our News Section. The railways owned and worked by the State had at the end of 1934 a length of 11,400 km., and in addition the State worked 2,095 miles of private railways. There are also 254 km. of private railways worked by private companies, and 74 km. worked by foreign States, making a total of 13,823 km. of Czechoslovak railways. Foreign railways in Czechoslovak territory have a total length of 106.5 km. Of the total construction length of the State-owned railways 15.64 per cent. is double track and 0.03 per cent. triple-track. The Czechoslovak crown (Kč) is now equivalent to just over 2d.

On the State railways in 1934 passenger numbers increased by 6,423,121, or 3.30 per cent., but receipts from passenger and luggage traffic declined by Kč. 34,275,203, or 4.51 per cent. On private railways worked by the State passenger numbers decreased by 3,220,270, or 12.31 per cent., and passenger and luggage receipts by Kč. 12,939,654, or 19.03 per cent. In goods traffic, on the other hand, there were substantial increases both in tonnage and receipts on both classes of railway. Mail and other transport receipts were up by

Kč. 14,807,275, but miscellaneous receipts were down altogether by Kč. 48,652,686. Figures in the accompanying table relate to the railways (State and private) worked by the Czechoslovak State:—

	1934	1933
Kilometres open	13,495	13,491
Passengers	224,199,093	220,996,242
Paying freight, tons	52,920,369	48,708,648
Ton km., paying freight ..	6,369,994,473	5,812,787,218
Operating ratio, per cent. ..	114.05	119.55
	Kč.	Kč.
Passenger and luggage receipts	780,611,181	827,826,038
Freight traffic receipts ..	2,125,745,174	2,023,101,070
Gross receipts	3,399,451,785	3,377,867,949
Working expenses	3,877,033,817	4,038,277,904
Loss on working	477,582,032	660,409,955

On the State railways alone the operating ratio was 111.53 per cent., as against 149.18 per cent. on the private railways worked by the State. Private railways worked by companies had an operating ratio of 98.34 per cent. Working expenses on the State railways decreased by Kč. 146,696,876, or 3.98 per cent., and on private railways worked by the State by Kč. 14,547,211, or 4.17 per cent. Payments to the staff decreased by Kč. 92,243,167 (4.11 per cent.) and for material and supplies by Kč. 54,453,709 (3.77 per cent.) on the State Railways, and on the private railways worked by the State staff payments were Kč. 17,269,387 (9.09 per cent.) lower, but expenses for material and supplies increased by Kč. 2,722,176, or 1.70 per cent. The number of staff on all railways worked by the State was 132,700—or 6,320 fewer than in the previous year—and they received a total of Kč. 1,857,997,426, or 47.92 per cent. of the working expenses. On the State-owned railways the working deficit was reduced in 1934 by Kč. 168,908,708, or 31.57 per cent., and on the State-worked private railways by Kč. 13,919,215.

* * * *

Railway Charges

THE powers conferred on the railway companies by the Road & Rail Traffic Act, 1933, to make agreed charges for the conveyance of merchandise, subject to the approval of the Railway Rates Tribunal, have proved of considerable assistance to them in their efforts to retain and regain traffic from other methods of transport. There is a steady demand from traders for the application of this method of charging to their traffic, but the necessity for the most careful investigation and tests before a figure can be agreed naturally retards the very rapid extension of the principle. There are, however, more than 220 such agreed charges in operation at the present time, covering a surprisingly wide range of traffics, and it is probable that between five and ten per cent. of the railway revenue from general merchandise traffic is now derived from this method of charging. Railway charging practice did not become static by the introduction of this new principle, however, as to meet the requirements of traders and others it is frequently necessary to give "lump sum" quotations covering the whole of the work incidental to household, factory or farm removals, and so forth.

Another experimental method of charging by the London & North Eastern Railway was approved by the Railway Rates Tribunal on February 18 in connection with the carriage of potato traffic from East Anglia to London. The eastern counties are one of the most important potato growing areas in the country and very heavy tonnages formerly passed by rail to Somers Town and King's Cross where well-established markets exist.

Road hauliers have been competing for the traffic for some time, however, and in fact a very substantial tonnage has been lost to road transport. The best method of retaining the existing carryings and regaining a proportion of the traffic now passing by road has been engaging the careful attention of L.N.E.R. for some considerable time, and ultimately, with the knowledge of the National Farmers' Union and the Potato Marketing Board, a scheme was prepared for the division of the growing areas into groups and the introduction of a "group" rate in each area.

After a detailed examination of the geographical relation of the various potato forwarding stations to London and the prevailing road rates, the stations were divided into nine areas or groups and the average chargeable distance to London calculated for each of the groups. The appropriate standard rate for the average distance of each group was then taken, reduced by 40 per cent. and the result rounded off to the nearest 3d., this reduction being estimated to be sufficient to place the railway in a competitive position with the road hauliers. As each group rate applies to a number of stations, it is evident that the rates to be charged from those stations in the group which are farthest from London will be more than 40 per cent. below the normal standard charge, while the reduction in the case of the stations nearer to London than the average distance of the group will be less than 40 per cent. below the standard. It was necessary for the whole scheme to be explained to the Railway Rates Tribunal, and its approval was sought and obtained for the introduction of the necessary exceptional or group rates which were more than 40 per cent. below the standard.

* * * *

New Locomotives for Mountain Service

THE introduction on the German State Railway of the remarkable 2-10-2 type tank locomotive illustrated and described on pages 509-512 of this issue, has made possible through running from Dresden to winter resorts and holiday centres on the heights of the Saxon Erzgebirge by the conversion of the narrow-gauge Heidenau-Altenberg mountain line to standard gauge operation without the expense of easing the curves and gradients. With the alteration of the permanent way standards new rolling stock equipment became necessary and the conditions imposed on the locomotives constituted a difficult but attractive problem. Without exceeding an axle load of 18½ tons it was required that the engines should each be capable of hauling trains of six 8-wheeled coaches, of about 180 tons total weight, at a speed of 25 m.p.h. on gradients ranging from 1 in 27 to 1 in 30 with curves of less than 7 chains radius. Also in order that the journey time over the level section between Dresden and Heidenau might be shortened the locomotive was required to have a maximum speed of 43½ m.p.h. and it has subsequently been found practicable to raise this speed to 62.1 m.p.h. Large coal and water capacities were an important consideration, as, indeed, was the fact that dead-weight had to be reduced to a minimum. The resulting design was for a tank engine of the 2-10-2 type with special provision to permit of running on curves of 5 chains radius. What is known as the Schwartzkopff-Eckardt bissel construction has been adopted for two of the four engines comprised in the order, including the one illustrated. The others are fitted with the Luttermoller end axle system. Both systems are designed for the purpose of rendering locomotives having several pairs of wheels coupled for adhesion purposes unusually flexible on curved sections of line.

The Modern Mixed Traffic Locomotive

ONE of the most noteworthy features of modern locomotive practice is the prowess of the mixed traffic engine. At one time its sphere of activity did not extend in passenger service beyond the haulage of heavy excursion trains and other duties where sustained high speed was not required; today mixed traffic engines are found regularly on fast expresses. For ten years after the war large numbers of Moguls were built by all four groups and these engines were, in emergency, not infrequently drafted to express duties. An outstanding run of this kind was made by the Great Western 2-6-0 No. 5346, which hauled an up 2-hour Birmingham express of 437 tons tare and 470 tons gross over the 23.4 miles from Snow Hill to Leamington in 26½ minutes, attaining a maximum speed of 75 m.p.h. downhill. Work such as this led to the Moguls being recognised as reserve express engines, but their limited boiler power naturally weighed against their regular employment on such duty. To meet the demands of accelerated express freight traffic, the modern tendency is to build mixed traffic engines of the 4-6-0 type, and the latest examples on the G.W.R. and L.M.S.R. are about the most versatile locomotives ever put on the road in this country. In addition to their fast goods and other mixed duties, the Great Western "Hall" class engines work on the West to North expresses between Bristol and Shrewsbury, taking loads of 400 tare tons unassisted over Llanvihangel and Church Stretton summits.

It is on the L.M.S.R. especially that the capabilities of the modern mixed traffic engine are being so variously exploited. Mr. Stanier's 6-ft. 4-6-0's are now the premier locomotives of the Highland section, and to a large extent on the Caledonian too, north of Glasgow. On all parts of the line, where loading regulations permit, they are engaged in all classes of goods traffic, and on the Western and Midland divisions they are regularly rostered to work expresses on "special limit" timings. Some particulars of recent runs will serve to show the range of their capabilities. On the Highland, a southbound express of 190 tons tare was worked from Inverness over the 1,354 ft. altitude of Slochd summit on 15 per cent. cut-off; in contrast to this, maximum speeds up to 88 m.p.h. have been recorded with Midland division expresses. On the Western division, No. 5153, hauling a gross load of 490 tons behind the tender, ran the 21 miles from Lancaster to Preston in 26 min., attaining a speed of 69½ m.p.h. on the level. No. 5028, hauling 380 tons on the up Sunday Scotch express, passed Rugby, 75.5 miles, in a net time of 74½ min. from Crewe, only 90 seconds slower than the schedule of the up Liverpool Flyer. Down a grade no steeper than 1 in 650, 79½ m.p.h. was attained, and on the 3¼ mile bank at 1 in 320 south of Nuneaton speed fell only from 69 to 63½ m.p.h.

A discussion of the subject could not be regarded as complete without reference to those astonishing locomotives, the rebuilt P.O.-Midi 4-8-0's, which, with their 6-ft. diameter coupled wheels can certainly be classed as mixed traffic engines. Until the fact was actually demonstrated, a locomotive having eight coupled wheels of this diameter would hardly have been expected to attain a speed of 90 m.p.h., much less with a load of 635 tons behind the tender; yet this feat was achieved in the course of the altogether phenomenal test run carried out on the Northern Railway of France, from Calais to Paris. On this run, with a 635-ton load throughout, the 102.9 miles from Calais to Amiens were covered in 85 min. 32 sec., and the 80.8 miles from Amiens to La Chapelle in 70 min. 25 sec., in each case start to stop.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

"My Chief Inspecting Officer"

(Mr. Hore-Belisha)

Coll-Earn, Auchterarder,
Perthshire.

March 7

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR.—Under your dry-as-dust "Stray Railway Trucks" (page 482) lies a blow on the eye, as the French have it—"My Chief Inspecting Officer's Report," so Mr. Hore-Belisha in the House of Commons.

It is all very well for a real King to say, "L'Etat c'est Moi." But a Cardinal of York rises to the sublimest heights of impudence, especially in the face of an active beheader like Henry VIII, by issuing decrees of State beginning, "I and the King."

Both the Lord Justice-General of Scotland and the Lord Chief Justice of England, speaking in Court as Presidents of the Supreme Courts of the two Kingdoms, have spoken strongly against the rapidly growing evil of Government officials issuing ukases or giving quasi-judicial decisions as if they were the Legislature or His Majesty's Judges. The assumption of the little "my" may be the smoke which shows a dangerous bureaucratic fire hidden, but there, which needs a dose of cold water.

But, in truth, it seems offensive with regard to highly placed experts. These railway inspecting officers hold a quasi-judicial position of great moment; in many ways somewhat like Coroners in England and the Procurators-Fiscal in Scotland—albeit the latter hold inquiries in secret; we Scots criminal lawyers look with horror and amazement at the Coroner's open so-called Courts. Far different from the latter are the careful and fair railway accident inquiries. In high 50 years' close study of these Inspectors' Reports I have only once been sure the conclusion was wrong (having been present), and that was 46 years ago.

I feel indignant that these men should be referred to as if a Chief Sanitary Inspector were quoting his drains inspectors to the Burgh Engineer.

I remain,

Yours in a bad mood,

NORMAN DORAN MACDONALD

Minimum Times for Late-running Trains

Ivy House,
Lingfield, Surrey.

March 10

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR.—My experience of British main line express train running has recently been so bad, that I feel your columns should bear witness to the deterioration in punctuality that is taking place.

During the opening weeks of 1936 in 17 journeys in express trains spread over different main lines, I have had only four punctual arrivals and all the other journeys have ended from 1 to 13 minutes late. I have excluded runs made on foggy days and boat train journeys, when the latter have not begun to schedule time. In all cases the most modern locomotives working normally over the particular section were employed and loads were in no cases abnormal. The causes of the delays were partly signal checks, partly overtime at intermediate stations and partly poor engine work.

In no instance was any real effort made to regain lost time and the purpose of my letter is to emphasise the necessity of a proper policy of making up time lost. I suggest minimum times should be laid down which should be worked to when trains are running late. These could approximate to or even be rather better than the best timings already applying to certain trains. As instances, I would suggest that up L.M.S. expresses leaving or passing Rugby behind

time should work at least to the timings of the 5.25 p.m. ex Liverpool over this length. Into King's Cross the 9.40 a.m. schedule from Grantham should serve as a model for the other less tightly timed trains over this section, when they are late. In this way the old argument that making up lost time involves dangerous running is answered.

I travel frequently on the Continent and I can assure you that a late arrival is now exceptional; invariably time is regained in the unusual event of a train running out of place.

High speed has been proved safe and an attraction to the public, but a big improvement in adherence to schedule in this country is essential before we can claim (as we so frequently do) that our main line services are the best in the world. Those of us who travel widely with unbiased minds know that they are not. Mere timetable promises are worth nothing and my own and my friends' experiences prove that in very few instances are they being fulfilled.

Yours faithfully,

G. P. J. DE CLERMONT

WATT BICENTENARY EXHIBITION.—To commemorate the bicentenary of the birth of James Watt at Greenock on January 19, 1736 (to which we made editorial reference on page 136 of our issue of January 24), a special memorial exhibition is being held at the Science Museum, South Kensington, London, until April 19. It is open free on weekdays from 10 a.m. to 6 p.m., and on Sundays from 2.30 to 6 p.m., but the museum (and consequently the exhibition) will be closed on Good Friday. Many objects of particular interest are being shown, including three original beam engines, two of which were erected in Soho Manufactory in 1777 and 1788 respectively and the third in London in 1797, and various original experimental models, including the separate condensers of 1765 which led to Watt's most important contribution to the development of the steam engine. The garret workshop, where Watt frequently worked from 1790 until his death in 1819, and which was moved with its contents from Heathfield Hall near Birmingham to the Science Museum in 1924 for permanent preservation, is also on view. Many drawings, some by Watt himself, have been lent by the Birmingham Public Libraries Committee and form a detailed survey of the progress in steam engine design from 1775 to 1800, the period of Watt's partnership with Boulton. The human side is illustrated by numerous portraits of Watt, Boulton, and their scientific friends, which have been lent for the occasion by the National Portrait Gallery, the Victoria and Albert Museum, the Royal Society, the City of Birmingham Art Gallery, and others. About one hundred letters between Watt and Boulton have been selected from the voluminous correspondence preserved at the Assay Office, Birmingham, and which gives an intimate picture of Watt's difficulties and achievements. Some of the memorials and books written on the life and work of Watt are exhibited also. Catalogues of the memorial exhibition, the garret workshop and the stationary engine collection are on sale in the Science Museum; and special bicentenary lectures are being given by the guide lecturer in the lecture theatre and the gallery on various days during the period of the exhibition.

TRUNK ROADS IN IRAQ, TRANSJORDAN AND SYRIA.—Messages from the Middle East indicate that the Governments of Great Britain, Iraq, and Transjordan are considering the construction of a trunk road to connect Baghdad with Amman. If, as seems likely, this scheme bears fruit, it will have a considerable effect upon the prospects of the Baghdad-Haifa railway project, and possibly upon other proposed lines. Work is already in hand upon the Baghdad-Damascus trunk road, states *Great Britain and the East*.

PUBLICATIONS RECEIVED

B.S.I. Handbook of Information, January, 1936. London: British Standards Institution, 28, Victoria Street, S.W.1. 1s. 4d.—The B.S.I. has just issued its half-yearly handbook which includes the indexed list of current British Standard Specifications to January 1, 1936, as well as special reports on standardisation in the mechanical engineering industry by the chairman, Mr. William Reavell, and on standardisation in the iron and steel industry by Sir William Larke. A new feature is the index to the methods of test contained in British Standard Specifications.

G.W.R. Holiday Haunts, 1936. 8½ in. × 5½ in. × 1½ in. 1032 pp. Price 6d. net.—Many are the different characteristics of the territories served by the Great Western, but as befits the "royal road" there seems to predominate everywhere an atmosphere of simple grandeur and dignity. Although expressed in a different medium, the same impressiveness is apparent in the rugged Cornish coast as is conveyed by the massive turrets of Windsor Castle. Somerset, too, with its Cheddar Gorge; and South Wales, rich in castles; and Warwickshire, steeped in Shakespearean traditions, all present aspects of our island kingdom in its noblest moods. To leaf through the pages of this popular guide is to set surging through the mind an insatiable desire to discover these things for oneself. What more could Mr. Maxwell Fraser, the compiler, wish to achieve than this? But the virtue of Mr. Fraser's work lies not only in the compilation of the illustrations, reproduced in photogravure. The descriptive matter is equally good, and the arrangement of the hotel and accommodation guide is admirably carried out. Special mention must also be made of the particularly clear maps. The copy we have received is deservedly bound in an attractive blue cloth cover.

Holidays by L.M.S., 1936. 8½ in. × 5½ in. × 1½ in. 928 pp. Price 6d. net.—Happiness may be said to be the theme of the 1936 edition of this attractive annual, and the radiant figure of the young bathing belle that brightens the front cover serves to exemplify this. The L.M.S.R. is rich in holiday territory; indeed, so much so that it is found necessary to exclude from this 928-page volume the Scottish resorts, which have devoted to them a separate guide. Even so, the districts served in England and Wales provide the prospective holiday maker with an extraordinarily wide choice. Who could fail to be satisfied with the rugged Welsh mountains, the mist-laden lakes, bracing Blackpool, dignified Chatsworth, and tranquil Tewkesbury from which to choose? Having chosen with the aid of the many splendid photogravure illustrations one of these, or maybe another of the many equally

attractive centres described, the holiday maker can then turn to the hotel, boarding-house, and lodgings guide to find suitable accommodation. Reference to the section, "A Few Holiday Facts," will also repay itself, for here the traveller will find many useful points about the L.M.S.R. services. For instance, after reading this, it may be decided to add novelty to this summer's holiday by reserving a caravan coach in some delectable spot.

The Holiday Handbook, L.N.E.R., 1936. 8½ in. × 5½ in. × 1½ in. 808 pp. Price 6d. net.—The L.N.E.R. has imported the first swallow of the year. Diving, with poised wings, across the marine blue cover of "The Holiday Handbook" for 1936, it heralds the approaching summer, and challenges the attention of the prospective holiday-maker to the resorts of "Britain's drier side." Once captured, the attention will not easily wander, for this 800-page book contains a veritable plethora of attractive matter. Dispersed among the mass of well set-out details of hotel and boarding house accommodation, are four photogravure sections, each printed in a tint appropriate to the scenery illustrated, which give a vivid conception of the sort of pleasures that may be expected. The needs of both the gay and the contemplative are remembered. In East Anglia, for instance, the choice can be made between Clacton and Norwich. Likewise, Scotland presents the contrast of Edinburgh and Braemar. In order to make reference easy, the guide is divided into four sections, classified as Eastern Counties; Yorkshire; Northumberland, Durham and the Lake District; and Scotland. A prefatory section, entitled "Glimpses at the Guide," incorporates details of railway travel facilities.

Southern Railway, Hints for Holidays, 1936. 8½ in. × 5½ in. × 1½ in. 936 pp. Price 6d. net.—Everyone has his or her own conception of what is a perfect holiday. Some seek a haven of rest, others a riot of pleasure, and the rest one of the "infinite" intermediate varieties. This being so, "Hints for Holidays" may claim to be a real holiday guide, for, within the compass of its 936 pages, each centre served by the Southern Railway is carefully analysed. Population, altitude, climate, subsoil, aspect, recreations, churches, and a number of other details are all listed. Thus the holiday-maker can first prescribe his or her own requirements, and then consult "Hints for Holidays" until the resort after his or her heart is found. However, even the less meticulous, who have little partiality for such planning, will find this profusely-illustrated book invaluable in the selection of a Southern holiday. The varying attractions, for instance, of the Kentish coast, the South Coast, the Channel Islands, and North Cornwall, are all contrasted in text and illustra-

tions. For the more sophisticated, glimpses are given of Canterbury, Winchester, and Salisbury. The hotel guide is simply and effectively arranged, the printing throughout being in Southern green on cream paper.

Permanent Way Institution Journal, December, 1935. Vol. LIII, Part III. Published by the Institution. Price 2s. 6d.—This issue of the Permanent Way Institution Journal is notable for a verbatim report of Dr. McCance's important paper read at the Summer General Meeting at Glasgow on the "Wear of Steel in its Application to Steel Rails." A summary of the paper was published in THE RAILWAY GAZETTE of July 12, 1935, but the present report includes illustrations. Another useful illustrated article is one on "Measured Shovel Packing," by G. F. Kent.

Lock Washers.—A report by the National Physical Laboratory on Palnut lock washers, manufactured by the Palnut Co. Ltd., 26-30, Holborn Viaduct, E.C.1, has been issued in the form of an illustrated booklet. Particulars of the sizes of washer for the standard threads, and of the principles of its action, are included. Palnut washers grip the nut for almost a complete circle, and can be easily removed without damage to the bolt or the screw thread. The N.P.L. report states that the washers did not fail during tests lasting 83 hours, in the course of which the oscillating device to which they were connected made 6,298,000 cycles, and seventeen bolts and one bar of the shaking frame were fractured.

Electrodes for Welding.—We have received from Murex Welding Processes Limited, Ferry Lane Works, Forest Road, Walthamstow, a booklet dealing with Belfinish electrodes. These electrodes are designed specially for making neat fillet welds of correct contour and ample strength, and comparative illustrations of welds made with general purpose and with Belfinish electrodes show the clean finish and neatness of joints made by the latter. This result is obtained without further treatment after the removal of slag, for which operation a few light blows with a hammer in the vicinity of the weld suffice. The booklet includes operating instructions for users.

Oxygen Cutting Machines.—An illustrated descriptive handbook dealing with the installation and operation of oxygen cutting machinery has been published by Hancock & Co. (Engineers) Ltd., Croydon. All the cutting machines produced by the firm are dealt with, but the book is written from the operator's point of view, and is intended as a working manual rather than as a catalogue. The many illustrations and diagrams, and the pages giving general hints on oxygen cutting, will be found of assistance to all engaged in work of this kind. Specimen cuts illustrated include gearwheels cut in 2¼ min. from ¾-in. plate, and a locomotive spring box 7½ in. thick cut at a speed of 3 in. per minute.

THE SCRAP HEAP

Indian railway authorities are baffled by thousands of "bilkers" who want to be arrested. Beggars have for a long time been making a practice of travelling on the railways without tickets so that arrest will lead them to the "comforts" provided in the prisons. This is especially the case during the winter. Officials are almost at their wits' end trying to deal with this. Now they propose amendments of the law to secure harsher punishment for ticketless travellers. They state that 2,700,000 persons have been actually detected without tickets getting free rides on the trains annually,

representing a loss to the railways of £375,000. The number undetected is much greater still.

* * *

The boys at first wore a uniform approved and partly designed by the Prince Consort, and it remarkably resembled that of the porters and ticket-collectors of the South Eastern Railway on which Wellington College was situated. This gave rise to little confusions. Lord Derby, for instance, when paying a visit to the college on the annual speech day, presented the outward half of his return ticket to

a boy who had come down to the station to meet his mother, and the boy was not as respectful as he should have been to a member of the governing body, and permitted himself to say something unbecoming to a well-behaved ticket-collector. It was therefore better to modify the uniform than risk the recurrence of such incidents.—From "As We Were" by E. F. Benson.

* * *

The Canadian Pacific Railway is commencing to run a series of through colonist trains from points in Ontario and Quebec to Winnipeg and the Canadian North-West by its all-rail Canadian route.—From the "Canadian Gazette" of March 11, 1886.

One Hundred Years Ago

Extracts from the March, 1836, issue of "The Railway Magazine" (afterwards "Herapath's Railway Journal") and the oldest constituent of THE RAILWAY GAZETTE

Rail-roads are indeed introducing a new era into civilised Europe, of which it is impossible to foresee the results or anticipate the advantages. Our very language begins already to be affected. Men talk of "getting up their steam" whenever they want to make some great effort or exertion; and when their tongues outstrip truth, they are said to be "going it, or rattling along at a railway speed." The "Lion of the day" will ere long give place to the "Loco-motive of the day." Distances, which used to be reckoned in miles, are now likely to be reckoned in hours and minutes; and a merchant who lives some thirty miles out of London, will tell you that he lives an hour from the Exchange. Conversely, tales and stories, which were wont to be measured by the time they occupied in telling, will very shortly be denominated by the distance between the points of beginning and end; so that we shall probably have a young lady telling her mamma of a delightful tale she listened to 120 miles long.

The great advance which has taken place in the price of iron within the last few months, has led many persons to ask whether this is in consequence of the increased demand which the introduction of rail roads has caused for that article. Although it is probable that that is not the sole cause, it may very fairly be considered as the principal one; for although there is certainly an increased export of manufactured iron, it is not sufficient to warrant an advance of 85 per cent. in the price, which is the increase since June last. . . . Prior to the latter end of the last century, scarcely any but cast iron was made in this country. The quality of the bar iron being so bad, that foreign iron was almost universally used. So complete a change, however, has taken place in this

respect, that it may almost be said that foreign iron is not used at all in this country at the present time, except for the making of steel; foreign iron being made with charcoal instead of coke, rendering it more suitable for this purpose.—From a "Letter to the Editor."

CONDENSED AIR ENGINES FOR RAILWAYS

Our ingenious townsman, Mr. Alexander M'Grew, has invented a mode of obtaining and applying power for the purposes of propelling cars upon railroads, and boats upon canals and rivers, which we deem of the utmost importance; and which, in our opinion, must, sooner or later, in a great measure, supersede the use of steam. The power is derived from condensed air, obtained and applied in a manner so cheap and simple, as to render the expense a matter of little or no consequence. We have witnessed, by the politeness of Mr. M'Grew, the practical operation of this invention, and are fully convinced of its entire success. Mr. M'Grew has exhibited his plan and practical models to several of the most distinguished engineers in the United States, all of whom concur in deeming the invention of the highest possible importance, and declare their belief that it will almost entirely supersede the use of steam. The inventor has taken out a patent.—From the "Cincinnati Whig."

We hope Mr. M'Grew will not deceive himself. If he succeed in this, it will be much more than we expect.—Ed. R.M.

THE GREENWICH RAILWAY.—This railway has at length commenced running for pay, though only about 2½ miles of the middle of it, from Deptford to Bermondsey Street, have been finished. An account of the receipts from the 8th, the day on which

the running commenced, to the 19th, are in the editor's possession, and show a progressive and rapid increase. The daily average of the first week's returns was about £17; of the last nearly £31 or £11,300 per annum. In this calculation, Sunday's traffic, which would have been exceedingly great, is omitted because there was no running. We are sorry to hear, that the carriages have not been running on either of the two Sundays. What can be the reason of this? Surely there can be no scruples on that score? We cannot for a moment suppose, that the directors who keep up their police, keep men to receive tolls, and to show the carriages, the arches, the railway, &c. for profit on a Sunday, and very properly so, can have any qualms as to allowing an inanimate machine to roll over the railway on that day, for the convenience of the public. . . . Since writing the above we have made inquiries, and find that the suspension of running on Sundays is owing to the want of engines, and that as soon as they are well furnished, Sunday will not form a day of exception.

The Belgian *Moniteur* contains a royal ordinance respecting railroads, the substance of which is as follows: "In order to prevent accidents at the places where the iron railroads cross the ordinary roads, canals, or rivers, persons on foot or horseback, and carriages of all kinds, are not to proceed along the roads in sight of the train drawn by steam engines, till the latter have passed. They are to let the train pass, and remain at the distance of ten yards. The masters of ships, vessels, and boats of all kinds, must anchor, or stop at the distance of 100 yards from the bridge which they want to have opened, and cannot proceed till they receive permission from the bridge-keeper, who is to let them pass as soon as the train has gone by."

We hope our British legislators will take a lesson by this, and instead of throwing obstacles in the way, endeavour to remove them from the path of the great improvement of the age.—Ed. R.M.

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

VICTORIA

Decisions Connected with Improvement of Passenger Services

It was recently announced in Melbourne that the Railway Department had decided to spend a sum of £250,000 on the improvement of passenger services. This sum is, it is stated, to be distributed over the provision of the following locomotives and rolling stock:—

(a) A ten-coach, all-steel, air-conditioned train for the Melbourne-Albury section, costing £180,000. Work upon this train is already in hand at the Newport workshops.

(b) Two Mountain type locomotives to eliminate double-heading on the heavy Melbourne-Serviceton section, at a cost of £40,000.

(c) In the light of Mr. Clapp's experience, gained on his world tour, the purchase of two Danish diesel locomotives has been decided upon, these being considered more suitable for the conditions prevailing on Victorian lines—where the running of light train units is desirable—than other types previously contemplated. These locomotives are expected to be Frichs-built and of 400-550-h.p. Their cost is likely to be about £18,600.

(d) A sum of £1,000 is to be spent on the restoration of Pullman sleeping cars on the Serviceton line.

First Complete Air-Conditioning in British Empire

The decision to equip the Melbourne-Albury train with complete air-conditioning has been taken as a result of demands that have been, and are being, made for reservations in the experimental air-conditioned car that has been running for some months on the Victorian system: these indicate that the experience will be repeated in the case of the new train. In passing, attention is drawn to the fact that this experimental car was the first to be completely air-conditioned in the British Empire.

Moreover, taking as a basis for calculation the Melbourne-Albury section, the Commissioners have calculated, and are assured that, if only one more passenger on each journey is attracted to the railways by the added comfort of air-conditioning, the additional annual revenue will more than offset annual charges on the cost of equipping two cars. And on other lines too, a very small increase in traffic will be required to meet annual charges upon the outlay involved in air-conditioning equipment.

Light Railway in Hills Closed

The Railway Commissioners decided to close the Upper Ferntree Gully and Gembrook narrow-gauge line on January 13, despite vigorous protests from the residents in the hills. The decision was taken only after the most

careful consideration and investigation. The line in its time carried thousands of holidaymakers who will regret its closure.

WESTERN AUSTRALIA

New Railway to Gold Mine

In connection with the development of the Big Bell mine, the Government has agreed to provide a railway to it from Cue, a distance of 22 miles. An American syndicate is exercising an option on the mine and proposes to put £2 million into it, the first American capital in the gold mining industry in this State.

SOUTH AUSTRALIA

Important Overland Connection to be Constructed

After considerable discussion, spread over several months, upon the fate of the Port Augusta—Port Pirie—Red Hill line, a Bill was recently passed by the House of Representatives to ratify an agreement between the Commonwealth and the State of South Australia concerning this project. Under this agreement the Commonwealth will extend its 4 ft. 8½ in. gauge line from Port Augusta to Port Pirie, a distance of 56½ miles, and the South Australian Government will extend its 5 ft. 3 in. gauge line from Red Hill to Port Pirie, 28½ miles, at its own expense. The estimated cost of the whole 85 miles of line is £940,000.

This new connection, though it will save 70 miles on the overland journey, and will eliminate two changes of gauge, will still involve one, at Port Pirie, and proves that the question of unification of gauges throughout the Commonwealth is as far as ever from settlement.

ARGENTINA

Seed Tariffs

Some time ago the Great Southern, Western, Central Argentine, Pacific, and the French Buenos Aires Provincial Railways petitioned the National Railway Board, requesting that the rebate of 50 per cent. in force on the rates for grain and potato seed be reduced to 25 per cent., on account of the precarious financial condition in which they find themselves, and the increase in the basic prices of harvested grain. In acceding to this request, the board has published a lengthy statement to the effect that the opinion of the Ministry of Agriculture is directly contrary to the increase in the tariffs for seed, which is not in keeping with its own efforts to let the farmers have

seed on loan or long credit, in order to facilitate production. The board expresses the opinion that the measure is likely to have a boomerang effect on the railways themselves, that the latter have refused to reconsider the matter, and that the increase in rates is agreed to, rather than risk the possibility of the railways cancelling the rebate altogether, as was done by the Pacific and Western companies in connection with a rate for the transport of cattle.

Association of British Engineers in the Argentine Republic

This association recently held its annual general meeting in Buenos Aires, under the chairmanship of the President, Mr. G. W. Stephenson. The annual report and financial statement were duly approved, the ballot for the election of four members to the Council for the ensuing year resulting in favour of Messrs. J. R. Stratford Fox, C. H. Williamson, and A. M. Donaldson (all re-elected) and Mr. F. Harris. During the past session, the Council organised five visits and one lecture, as follow: July 23, visit to the Lacroze subway repair shops and electrical installations; August 3, visit to the constructional works of the new Alsina bridge and canalisation of the River Riachuelo; August 22, visit to the shipyards of Hansen Hansen and Puccini at San Fernando; September 12, visit to the central workshops of the Ministry of Public Works on the Riachuelo River; October 5, visit to the works of the Primitiva Gas Company; and October 24, paper by Mr. J. H. Taylor on "Modern Tendencies in Permanent Way Construction."

BRAZIL

Increase in Rates and Fares: Leopoldina Railway

The commission appointed by the Minister of Transport, in November, 1934, to examine the financial situation of the Leopoldina Railway, recently submitted its report. Among the urgent measures destined to alleviate the alarming plight to which the company has been brought by a series of factors, such as exchange depreciation, increased operating costs, swollen wages bills and uncontrolled road and navigation competition, the commission recommended a complete overhaul of rates and fares, many of which have hitherto been unremunerative or such as to leave a very small margin of profit. The main proposals were as follow:—

1. *Passenger*.—That there should be substantial increases in fares chargeable upon suburban and Petropolis services, especially in the case of first and second class suburban returns: corresponding increases in season ticket fares will also be made. Special tickets and rebates on suburban lines will be abolished, and the basic rate on long distance fares which

has hitherto been lower than on the other railways, is to be raised by roughly 20 per cent. On the other hand the transit tax, until now part of the fare, is to be suspended.

2. *Parcels*.—Rates for perishable parcels are to be raised, though, even so, they will still be below those of the other railways.

3. *Livestock*.—Rates for carriage of poultry, and for two categories of larger livestock are also to be altered, though these, too will still be below those in force on other lines.

4. *Goods*.—The kilometric base of the five highest rate classes of goods is to be decreased, and that of the three lowest rates is to be modified, so as to encourage long-distance traffic. The other seven classes of rates, including coffee, the mainstay of the company's revenue, are to remain unaltered. Additional special rates, rebates and modification of rates are to be permitted subsequently if adequate notice is given beforehand.

The Minister of Transport and the Governor of the State of Minas Geraes approved of the commission's proposals with regard to the rates and fares applicable to the Federal and Minas concession lines, and the corresponding increases and modifications came into force on February 15. They will hold good for the period of one year, after which the situation will be examined afresh. The Governor of the State of Rio de Janeiro is expected to agree at an early date to the increases and modifications affecting the charges on the concession lines of that State.

On the same date (February 15), the existing suburban service of 128 trains on weekdays and 106 on Sundays and holidays was increased by 44 and 22 trains respectively, and this will, it is hoped, relieve in some measure the serious congestion in the rush hours. Additional improvements, including the operation of certain branch and outer-suburban services with railcars, will be introduced when sanctioned by the Government authorities.

UNITED STATES

Snow and Cold Benefit Railways

Heavy snows and very cold weather during the past month have put the railways severely to the test, and on some lines there have been serious delays to train services. However, the bad weather has in many instances put the railways' competitors out of business altogether, and given the railways much traffic that they otherwise would not have enjoyed. The ability of the railways to carry on under conditions which have blocked the highways for weeks on end, has brought widespread favourable comment in the press, and has brought home to many sections of the public the essential nature of the services the railways provide.

This winter, as never before, the snows are bringing a new form of traffic to the railways, due to the growing popularity of ski-ing. The railways serving large centres in the East and

Middle West have been operating ski trains each week-end for the benefit of the growing army of enthusiasts for this sport, which has definitely caught the popular fancy, and is being stimulated by newspaper sports writers and by the advertisements of merchants who sell sports apparel and equipment.

Hopeful of Legislation

There are two bills before Congress in the enactment of which the railways are greatly interested. One would eliminate the "long and short haul clause" from the Interstate Commerce Act and permit the railways—as they are not permitted at present—to make exceptional rates to points where water competition exists, without making similar reductions to intermediate points where water competition does not exist. This measure, if enacted, would enable the railways operating between the Middle West and the Pacific Coast to regain much of the traffic they have lost to intercoastal water lines. The other measure which the railways hope Congress may enact is one providing for the regulation of water carriers by the Interstate Commerce Commission, as the railways and interstate highway carriers are already regulated.

Railways Increase Maintenance Expenditures

The railways are, at long last, definitely increasing their expenditure upon rail and other track materials, and upon supplies for equipment repairs as well. Several railways have placed substantial orders for freight cars, and considerable business for the locomotive builders appears to be an early prospect. These expenditures will, of course, deplete the rising revenues of the railways, but on the other hand, a return to something approaching normal buying by the railways has long been regarded as an essential element in general economic recovery. So it may well happen that this revival of spending by the railways may be the best assurance that the present revival in traffics will continue.

Revenues Increase Faster than Car Loadings

The Class I American railways in 1935 had gross revenues of £690,000,000—an increase of 5.5 per cent. over 1934. Working expenses at £518,000,000 were 6.3 per cent. greater than in 1934. Net railway operating income (*i.e.*, net earnings, after taxes, but before the payment of interest) at £100,000,000, was higher by 7.4 per cent. than in 1934. While the final figures are not yet available, the railways as a whole probably just about covered their fixed charges (rent and interest on bonds). In December, revenues were 15 per cent. greater than in December, 1934, whereas car loadings in December averaged only about 10 per cent. above those of the

preceding year. The greater increase in revenues than in car loadings is explained by the fact that the latter do not reflect increased loading per car—usual when traffic is on the upgrade—or increased passenger revenues. The fact that freight car loadings are currently averaging about the same percentage above the preceding year as they did in December, probably indicates gross revenues some 15 per cent. above last year, a most encouraging indication, and one which has driven shares of solvent railways to higher levels than have been seen for three years.

EGYPT

Mariut Line Extensions

The extension of the Mariut line from Fuka (km. 234.203) to Mersa-Matruh, is being pushed forward with all speed, and it is hoped that Mersa-Matruh (km. 311) will be reached by the middle of March. Abu-Haggag station at km. 247.899 and Sidi-Heneish station at km. 267.874 were opened for traffic on February 8. Some 5,000 odd men are now engaged on the new line, on which work was begun in December last. The distances given above are measured from Alexandria. It will be remembered that this line runs along the coast westwards from that port.

Helwan Line Developments

The Railway Board has decided to double the line between El-Saïda Zenab and Bab El-Louk, Cairo (1.139 km.), and to replace the existing fencing, which separates the line from the roadway—the centre of which it here traverses—by low walls. This will prevent road traffic from obstructing the diesel railcars which are to replace the steam service on this section of line. There is to be a ten-minute service of diesel units each with a trailer car.

SPAIN

Reinstatement of Railway Staff

The recently elected Government of Señor Azaña, has lost no time in showing its intention to deal with the reforms which formed a prominent part of the electoral campaign, and the general amnesty relating to the prosecutions arising out of the revolt of October, 1934, was voted and accorded by the Permanent Commission of the Cortes. A secondary consequence of the amnesty is the reinstatement in their posts of all men who left their duty during the revolt, and who were afterwards replaced by voluntary or other workers. The electoral pact covered the reinstatement of all those dismissed during the strike, and on February 21 it was intimated to the four principal railway companies that the Government hoped that they would voluntarily, and without awaiting a direct order, proceed to reinstate all

these men: tramway companies were also expected to do the same. The consequences of this order may be imagined, especially as some of the reinstated men are already claiming the payment of their full wages during the period in which they have been out of work (and, many of them, in jail). In the case of the Madrid tramways, something like 500 men have had to be reinstated most of whom are totally redundant, since the services of the company have been reorganised, but in spite of this, their wages will have to be paid, until, perhaps, another change in politics turns them out again. In the same way the railway companies will now find themselves with duplicate and redundant staff, just at a time when there is a still more alarming decrease in traffic.

Road and Rail Co-ordination

Another of the measures promulgated with startling rapidity by the new Government, is the repeal of the two Decrees relating to road and rail co-ordination. The first is that of July 19, 1934, under which a Co-ordination Commission was appointed, and concessions known as "exclusivas A" were granted to the railways for running lines of motor omnibuses on roads parallel to the existing railways. This is now repealed by a new Decree of February 24. The Decree of August 29, 1935, introducing new rules for the collection of taxes on motor vehicles transporting merchandise is also repealed by a Decree of the same date. It is not known how the Government intends to deal with the situation produced by the competition of "pirate" lorries, especially as the State is losing revenue calculated at some fifty millions of pesetas a year in taxes on this class of transport.

CHINA

Chekiang-Kiangsi Railway

Now that this line is open to Nanchang it is possible to travel by rail all the way from Shanghai to the Kiangsi capital, except for the crossing of the Chientang River at Hangchow. The bridge over this river is—as previously mentioned in these columns—now under construction, and is expected to be opened some time next year. But the Hangchow-Yushan section, opened throughout about two years ago, is of a lighter standard than the newly-opened Yushan-Nanchang extension; it is therefore to be relaid with heavier material once the bridge at Hangchow is open. The new through route will then be capable of carrying express traffic, which is in keeping with its destiny as part of the Canton-Shanghai trunk line. The headquarters office is at present being moved from Yushan to Nanchang.

The length of this railway now open is 397 miles (from Hangchow to Nanchang) and it is understood that its eventual destination is likely to be Yunan-fu in the far west, but that will

entail a further 700 miles of construction beyond Chuchow or Changsha where it will cut across the Canton-Hankow line. Such an extension will, however, traverse the full widths of Hunan and Kweichow provinces, tapping Kweiyang the capital of the latter *en route*, and open up an area where there is much disorder at present.

The Yushan-Nanchang section, which contains considerable bridging, is said to have cost \$18,176,600 and was financed by Chinese banks, but was constructed under German engineers and the permanent way, rolling stock and other equipment are also German, though the rolling stock has not yet arrived from Germany. Traffic is being carried on in old stock from the eastern section of the line until its arrival.

The Fu River Bridge

The Liangchiatu bridge over the River Fu, some 30 miles short of Nanchang is the *magnum opus* of the new section of line. It is some 1,650 ft. in length, has a maximum height of about 100 ft. and cost between \$3 and \$4 million. The design and sub-structural work were carried out by Chinese engineers, only the steelwork being German: the total weight of the latter is, however, 6,000 tons. The piers and abutments are of reinforced concrete.

Proposed Szechwan Line

The construction of a railway about 120 miles long between Chengtu and Chungking is under consideration and it is expected that a survey for the new line will begin shortly. To finance the construction of the railway bonds will be issued to the value of \$50,000,000 with a joint sinking fund of the Szechwan Provincial Government and the Nanking Government. Chungking is the principal commercial city of the Province of Szechwan and the new railway will place it in direct rail communication with Chengtu, the provincial capital. About two years will be taken in completing the survey.

MANCHUKUO

South Manchuria Railway Loans

Owing to the tardy taking up of the No. 48 Issue of debentures in January [mentioned in THE RAILWAY GAZETTE of March 6], which is said to be due to the fact that the market has had so many S.M.R. debentures, the Japanese Government Finance Department has been requested to subscribe to these debentures. In view of the further requirements in the current budget year the directors decided to make this request.

Soya Beans Traffic

The seasonal traffic of soya beans is a great problem to the Manchurian railways' traffic departments every winter. Some four million tons of beans have to be transported to Dairen where they are dried and pressed into oil or bean cakes for fodder. The practice over the whole country is to cart the

summer's harvest to the nearest railway station, where the beans are stored in the open under matting. It takes the best part of the winter to carry them to Dairen in train loads. This year the beans have suffered from an extremely wet season, and as they are rapidly deteriorating, the traffic officials have mobilised all available vehicles to clear the remaining stock of beans before April, two months earlier than usual.

JAPAN

Avalanche Accident

Another fatal accident was added to the series of mishaps caused by the severe winter weather reported in THE RAILWAY GAZETTE of March 6, when a passenger train carrying 50 passengers was hit by an avalanche between Suizu and Shimbo on the Hokuriku main line (the West Coast main line from Naotsu to Tsuruga) on February 1. The accident happened on a curve and on a down gradient of 1 in 40 just outside a tunnel. The engine and three carriages fell 120 ft. down the cliff, and only the van remained on the line. One passenger was killed, 15 were seriously injured and all the others received minor injuries. The service on the main line was suspended over its entire length as snow-slides occurred at several places that day.

TANGANYIKA

Improved Revenue during 1935

The total revenue of the Government Railways for the year 1935 was £591,966, as against £504,241 during 1934, an increase of £87,725. It is also £78,466 higher than the total estimated revenue for last year, or 15.3 per cent. Details of the two years' receipts are as follow:—

	1934	1935	Difference
Coaching	£ 76,631	£ 83,585	+ 6,954
Goods	401,492	483,120	+ 81,628
Telegraph, &c.	20,659	20,647	— 12
Steamships	5,459	4,614	— 845
	504,241	591,966	+ 87,725

SWEDEN

Proposed Railway Amalgamations

A fresh report upon the absorption of the privately-owned lines in this country by the State Railways, claims that if the 43 lines under consideration—having a total length of over 3,200 miles—come under Government administration, there will be a saving of 2,000 employees and of some Kr. 4,700,000 a year in operating and administrative costs, or roughly 8 per cent.

The latter claim is based largely upon a better use of rolling stock, including a reduction in the number of steam locomotives required by about 30 per cent. If the private lines were electrified—few of them at present being so—considerable further economies in conversion and operation would result.

FURTHER IMPRESSIONS OF OVERSEAS TRANSPORT

VII—A review of developments in shipping and air transport facilities carried out by the South African Railways and Harbours Board

By A. W. ARTHURTON, M.Inst.T., formerly Secretary, British Railways Press Bureau

SOUTH AFRICAN ports and harbours are under the management of the railway administration, and have played an important part in the development of the Union during the last two decades. Where railway and port operations are under one authority there is the fullest co-ordination in working, and the transport of traffic direct from or to the ship's side is greatly facilitated. In South Africa, too, not only the ports but also the buoys, lighthouses, dredging, pilotage, salvage, and similar services are under the control of the Railways and Harbours authority.

At Durban Harbour (Port Natal) the berthage accommodation available for shipping totals 17,600 ft., and vessels drawing over 30 ft. and with a gross tonnage of 25,000 are dealt with. In the Port Captain's launch I made a tour of the harbour, which is well equipped for the rapid handling of all classes of shipping and cargo. Among the cranes facilities are an 80-ton electric crane and a 25-ton floating-crane. The mechanical coaling plant situated on the opposite side of the harbour under the picturesque wooded bluff ranks among the foremost appliances of the type in the southern hemisphere. Another outstanding feature of the harbour is a graving dock 1,150 ft. long and 110 ft. wide at the entrance. Among the more recently introduced facilities both at Durban and Cape Town are extensive precooling sheds for citrus and deciduous fruits.

Grain elevators

The grain elevator system of the South African Railways is very extensive, and has proved a most valuable asset in coping with the seasonal rush of maize traffic. The capacity of the Durban elevator is 42,000 tons, and of that at Cape Town 30,000 tons; both have intake and shipping capacities of 1,000 tons an hour. There are also about 35 country elevators, and the total storage capacity of the whole grain elevator system is 182,900 tons. The system is provided with 2,000 bogie trucks of 40 tons carrying capacity for transporting grain in bulk. I was interested to find, when inspecting the elevator at Cape Town Docks, that, in addition to storing, the grain is also weighed and graded. It thus carries a Government guarantee which eliminates disputes between buyers and sellers as to quality and weight.

The railway administration also controls the South African Airways. Two years ago the Union Government assumed ownership of a commercial aviation company which had for 5½ years been operating regular services between Durban and Johannesburg, and Durban and Cape Town. Under the existing schedule a daily service in both directions operates between Durban and Johannesburg, the journey occupying just over two hours. The service between Durban and Cape Town connects with the incoming and outgoing mail boats at the latter point weekly.

Circular tours round the Union by air are also provided, and these embrace the South-west African Airways, which was acquired by the administration about a year ago. The air routes are worked by three 14-passenger

multi-engined Junkers air liners equipped with the latest direction-finding wireless apparatus; a series of ground stations similarly equipped is being laid down throughout the Union.

Harbour Improvements

We left Durban in the *Balmoral Castle*, and reached East London, South Africa's only river port, the next day. Here we lay outside in the bay, and, owing to rough seas, a huge basket holding ten persons and lifted by crane was used to transfer passengers from the ship to the tug and *vice versa*. At Port Elizabeth an enclosed harbour of 314 acres in extent and fully equipped with the latest appurtenances of a modern seaport has been constructed, and we were thus able to berth alongside the quay. At Cape Town, reached on the fourth day after leaving Durban, the old basin of 67 acres in Table Bay Harbour has proved inadequate and a new basin of 196 acres has been constructed. Owing to the Italo-Abyssinian war many vessels have been diverted from the Mediterranean route to the Cape, and among others the *Empress of Britain* on her annual cruise was expected to berth in the new harbour in a few days.

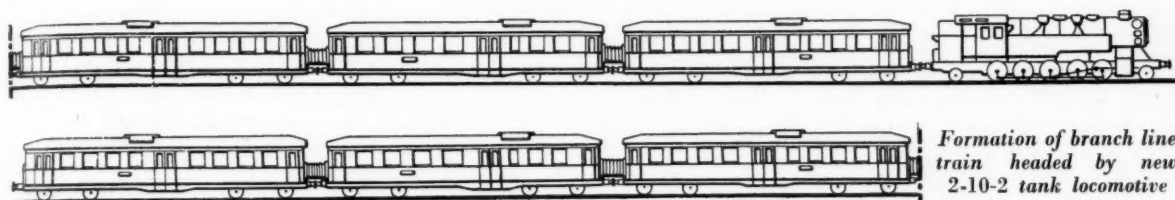
During the ship's five days' stay at Cape Town we were able, through the kindness of many transport friends, to see a great deal of the Cape Peninsula. Scenically, Cape Town owes much of its charm to its unrivalled background, Table Mountain. What is known as the table cloth frequently overhangs the summit, but we selected a day when clouds were absent, and ascended by the aerial railway, which was constructed some five years ago. From the top one gets a marvellous view of the whole of the Cape Peninsula, stretching to the Cape of Good Hope, and Cape Agulhas the most southerly point of Africa. The citizens of Cape Town are justly proud of the superb 100-mile Marine Drive. For half its length the road follows the Atlantic seaboard to Cape Point, and continues along False Bay through Simonstown and Muizenburg back to the city.

As a Member of Council of the Institute of Transport I was glad to find a very progressive centre of the institute in South Africa, under the chairmanship of Mr. T. E. Watermeyer, the General Manager of the South African Railways. The continued growth of membership—now about 500—has necessitated the formation of sub-centres at Johannesburg, Durban and Cape Town, where I had the pleasure of meeting the chairmen, secretaries and many of the members during my visit.

I cannot close without a word regarding the Railway Publicity and Travel Department, under the control of Mr. N. B. Hewitt, whose enterprise has done so much towards bringing travel conditions in South Africa into line with those in the foremost tourist countries. The well-known office at South Africa House, London, is part of this organisation. The Department also controls advertising and press publicity, bookstalls, trade advertising, and station showcases, and produces the *South African Railways and Harbours Magazine* and *South African Travel News*.

NEW GERMAN THREE-CYLINDER 2-10-2 TANK LOCOMOTIVES

Built for the German State Railway Company by the Berliner Maschinenbau A.G. (vorm. L. Schwartzkopff), and Orenstein & Koppel for sharply curved and steeply graded lines



Formation of branch line train headed by new 2-10-2 tank locomotive

THE remarkable 2-10-2 tank locomotive shown in the accompanying illustrations has made feasible through-running to winter resorts and holiday centres on the heights of the Saxon Erzgebirge, by the conversion of narrow-gauge mountain lines to standard gauge operation without the expense of easing the curves and gradients. The adaptation of the narrow gauge lines to modern traffic requirements by the provision of more powerful locomotives, eight-wheeled coaches, electric lighting, steam heating, and continuous vacuum brakes did not eliminate the disadvantages associated with the narrow gauge of 750 mm. (2 ft. 5½ in.) in respect of low speed, inconvenience to passengers in changing trains, and inadequacy of the narrow gauge rolling stock for the continually increasing winter sport traffic at week-ends.

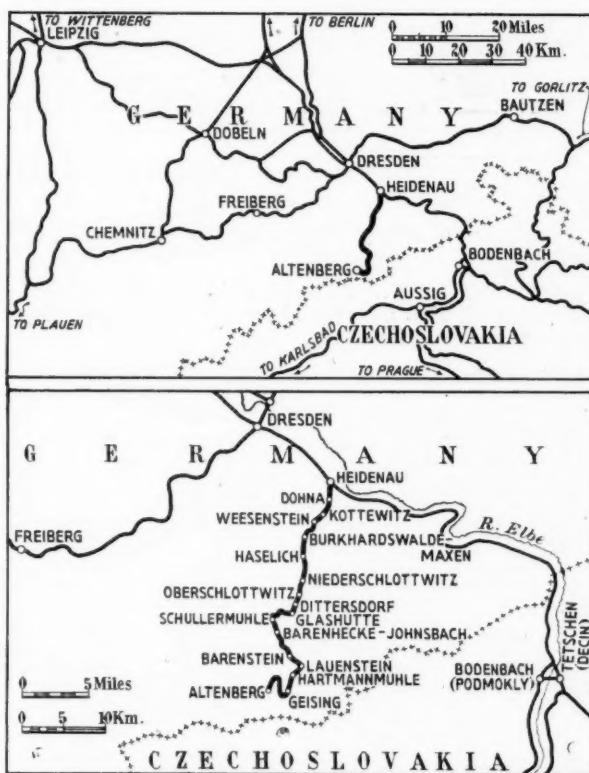
By the conversion of the Heidenau-Altenberg line to standard gauge, through running from Dresden is made possible, namely, to Heidenau on the Dresden-Bodenbach main line and thence on the 42 km. (26 mile) mountain section to Altenberg without changing locomotive or carriages. In order that the cost of the conversion might be kept within economic limits, it was essential that the layout of the mountain section should remain practically unaltered with its sharp curves and severe gradients for which the German State Railway had no suitable locomotives, railcars and coaches. New equipment had therefore to be provided, and the following notes* indicate the bases of design and the special features of the new constructions.

Bases of Design

The conditions imposed on the locomotive constituted a difficult but attractive problem. Without exceeding an axle load of 18.5 metric tons (18 tons 4 cwt.) it was required to be capable of hauling a train of six 8-wheeled coaches, of about 180 tons total weight, at a speed of 40 km. (24.9 miles) an hour on gradients from 1 in 27 to 1 in 30 with curves of 140 metres (459 ft.) radius. In order that the journey time on the level section between Dresden and Heidenau (11 km. or 6.8 miles) might be short, the locomotive was required to have a maximum speed of 70 km. (43.5 miles) an hour, and it was stipulated that it should be able to negotiate curves down to 100 metres (328 ft.) radius. Adequate coal and water capacities were an important consideration, and as the trains have to climb 634 metres (2,080 ft.) in a distance of 42 km. (26.1 miles), deadweight had to be reduced to a minimum. This condition was fulfilled by extensive application of the latest methods of light construction, particularly as regards

the welding of coaches, with the result that the new 8-wheeled third-class vehicles, built by the Linke-Hofmann Werke, Breslau, accommodating about 70 passengers, weigh only about 25 tons.

The performance required led to the design of a tank locomotive having the 2-10-2 wheel arrangement and sufficient flexibility to negotiate 100-m. curves, while ensuring smooth riding on straight track. Full theoretical investigation showed the choice to lie between Luttermöller end axles and the Schwartzkopff-Eckardt bissel construction. The Luttermöller arrangement, with radially adjustable end coupled-axes driven by gear wheels on the second and third



Sketch map of the Heidenau-Altenberg branch line, recently converted to standard gauge, for which the new locomotives are designed

* From a description by Reichsbahnrat Dipl.-Ing. F. Flemming, in *Verkehrstechnische Woche*, February 5, 1936.

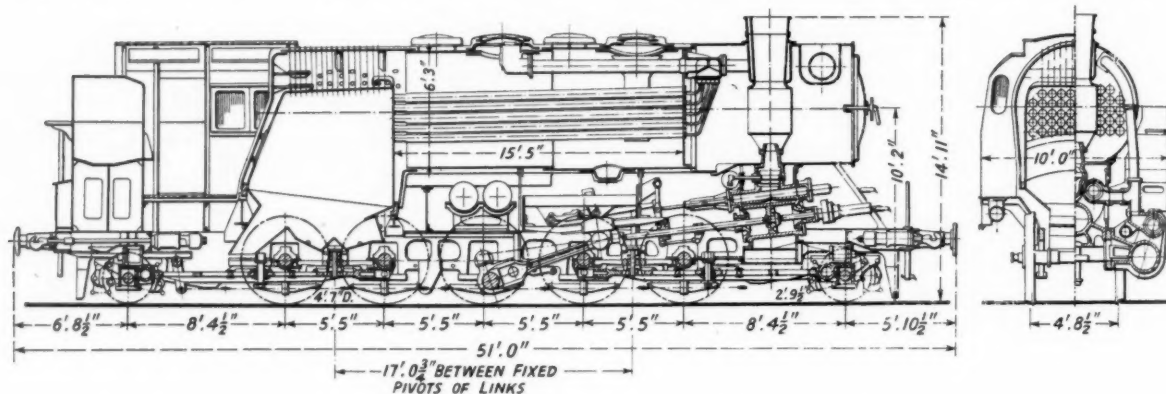
coupled axles, offered the advantages of a small angle of incidence and rigid mounting in the frames of the three central coupled axles. On the other hand, the Schwartzkopff-Eckardt bissel construction results in lower thrust on the flanges and permits the use of three cylinders. Practical trial being the only means of ascertaining which of these constructions is better suited to the service concerned, orders were placed for the construction of four locomotives, two of the Luttermöller type built by the firm of Orenstein & Koppel, and two with Schwartzkopff-Eckardt bisses by the Berliner Maschinenbau A.G. vorm. L. Schwartzkopff. The same boiler construction is used in each case, and the new locomotives are designated Series 84 in the German State Railway classification. The first of the engines to be completed was the Schwartzkopff-Eckardt bissel locomotive delivered early in December, 1935, and first exhibited to the public in the special parade before Herr Hitler at the Nuremberg Centenary Celebrations. This is the one shown in the accompanying illustrations and described below.

General Arrangement

The locomotive, is characterised by a special arrangement of the running gear, but otherwise employs as nearly as possible the same components as the Series 85

The frame plates are 80 mm. (about 3½ in.) in thickness. The Schwartzkopff-Eckardt bissel units at each end comprise the axle of the leading wheels and two of the coupled wheels. The driving axle is at the centre, and its bearings are mounted rigidly in the frames. The wheels on this axle are without flanges thus contributing to free running on sharp curves. The locomotive is guided, in both directions of running, by the special bissel construction. As in the Krauss-Helmholtz arrangement, the leading carrying axle is connected to the second coupled axle, and the trailing carrying axle to the fourth coupled axle, by radius bars 4,200 mm. (13 ft. 9½ in.) in length which swing about pivots mounted in the main frames. Side play is provided in the usual manner and powerful control springs are fitted. The second coupled axle is connected to the first and the fourth coupled axle to the fifth by a deflecting lever or link which is also pivoted in the frame. Thus only the centre or driving axle is fixed, the other four coupled axles being capable of controlled transverse displacement. Restoring springs are also fitted to the radius bars immediately behind the leading bissel, and in front of the trailing bissel, as shown in the drawings.

The distance between the pivots of the radius bars is 7,300 mm. (23 ft. 11½ in.); and that between the fixed



General arrangement of new Series 84 2-10-2 three-cylinder tank locomotive, German State Railway

locomotives of the German State Railway. The general arrangement is shown in the above drawing; the leading dimensions are as follow:—

Cylinders, diam.	..	..	480 mm. (18¾ in.).	
.. stroke	..	..	660 mm. (26 in.).	
Wheels, coupled, diam.	..	..	1,400 mm. (4 ft. 7 in.).	
.. bissel, diam.	..	..	850 mm. (2 ft. 9½ in.).	
Boiler working pressure	..	..	20 at. (284 lb. per sq. in.).	
.. heating surface—				
Tubes and flues	..	..	sq. m.	sq. ft.
Firebox	..	..	195.90	2,107.9
			14.20	152.8
Superheater	..	..	210.10	2,260.7
			85.00	914.6
Total	..	..	295.10	3,175.3
Grate area	..	..	3.76	40.46
Weight in running order	..	..	124.9 metric tons (122 tons 19 cwt.).	
.. empty	..	..	100.6 metric tons (98 tons 19 cwt.).	
Adhesion weight	..	..	90.9 metric tons (89 tons 8 cwt.).	
Water capacity	..	..	14 cu. metres (3,080 gall.).	
Fuel	..	..	3 metric tons (2 tons 19 cwt.).	

pivots of the links, between the 1st and 2nd and between the 4th and 5th coupled axles, is 5,200 mm. (17 ft. 0¾ in.). The latter dimension may be taken as the rigid wheelbase of the locomotive; it amounts to 44½ per cent. of the total engine wheelbase. Owing to the fact that the transverse displacements of the several axles in the leading and trailing groups are respectively controlled by the corresponding radius bar and link, the riding of the locomotive is exceptionally smooth, even at high speeds. At the same time safety is assured by the fact that the fixed pivots, between the 1st and 2nd and between the 4th and 5th coupled axles, are completely relieved of impact and tractive forces by the axleboxes and axlebox guides of the axles concerned. The side play provided for the radius bar pivots is so great that it is not fully utilised, even on a curve of 85 metres (279 ft.) radius, hence there is always a statically determinate control. The maximum transverse displacement of the carrying axles is 150 mm. (5¾ in.) on each side of the centre line.

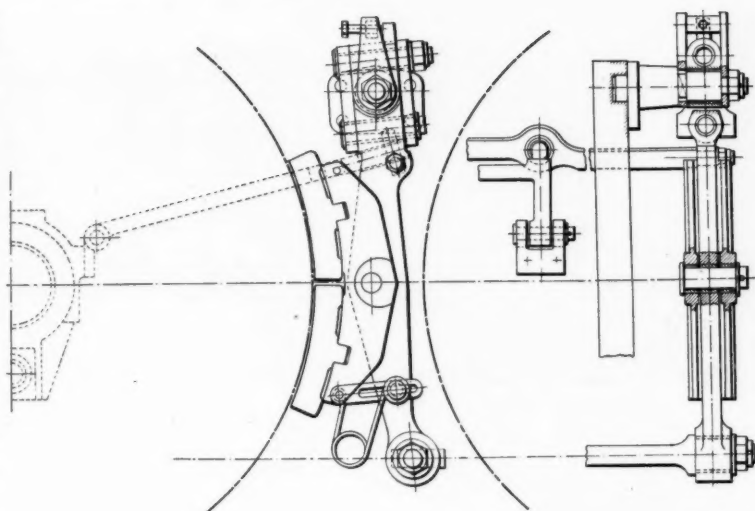
The locomotive enters curves smoothly for the reason that the deflection of the leading bissel axle sets up forces at the restoring springs of the carrying axle and radius bar, which deflect the engine in the direction of the curve. The force thus exerted on the second coupled

axle tends to move it outwards and the first coupled axle inwards, thus preparing the latter for entrance on the curve. The angle of incidence is naturally greater than with radial setting of the axles, and it amounts to about $1\frac{1}{2}$ deg. in the most unfavourable condition viz. on a curve of 140 metres (459 ft. radius). Too much importance should not be attributed to this, smooth running and low resistance on curves being largely determined by the flange reactions, which can be kept very low with this construction of running gear.

Motion Work

Single-axle drive is essential with the above-mentioned arrangement for controlling the transverse movement of four of the five coupled axles. On the other hand, the three-cylinder arrangement with single-axle drive ensures good starting characteristics, an important consideration in mountain service, and a low cyclic irregularity which contributes greatly to the smooth riding of the locomotive, particularly at the relatively high speeds required over the easier parts of the route. Cranking of the second coupled axle is avoided by oblique setting of the inside cylinder and the use of a long piston rod.

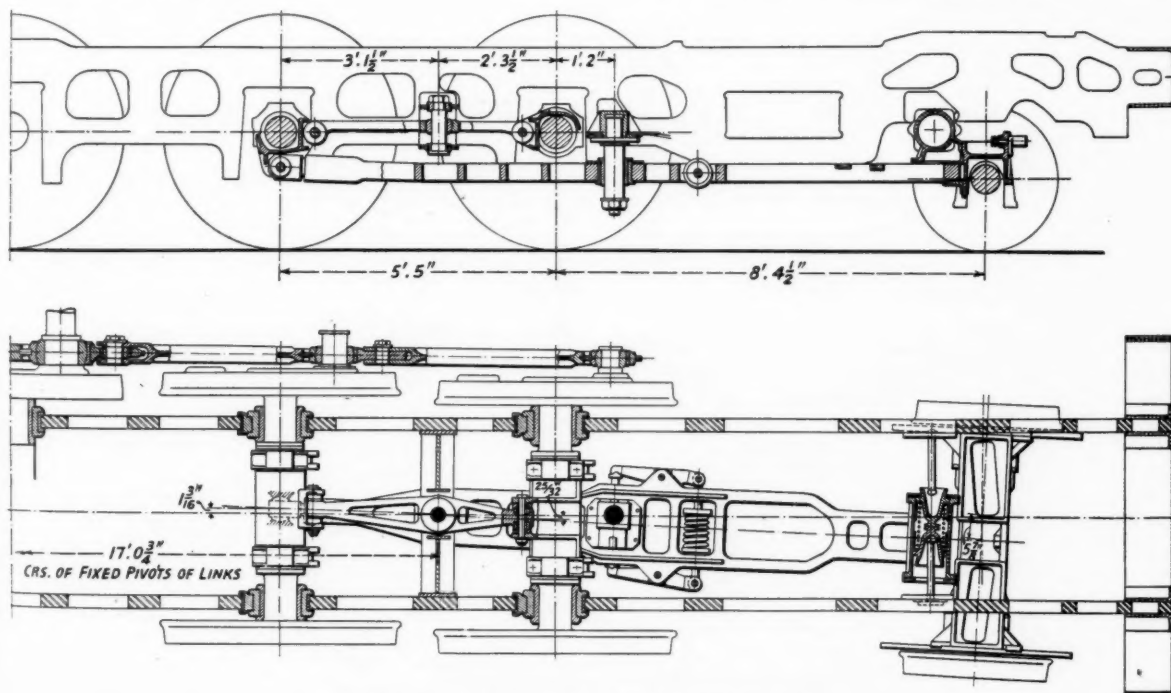
Steam distribution is effected by balanced piston valves of the Nicolai type, 220 mm. ($8\frac{1}{4}$ in.) diameter, the expansion link for the inside valve being driven by an eccentric on the fourth coupled axle, with spherical surfaces to allow for the transverse movement of the axle. The valve gear of the outside cylinders is driven by return cranks on the driving axle. The outside and inside connecting rods are respectively 3,100 mm. (10 ft. $2\frac{1}{16}$ in.) and 1,800 mm. (5 ft. $10\frac{7}{8}$ in.) long.



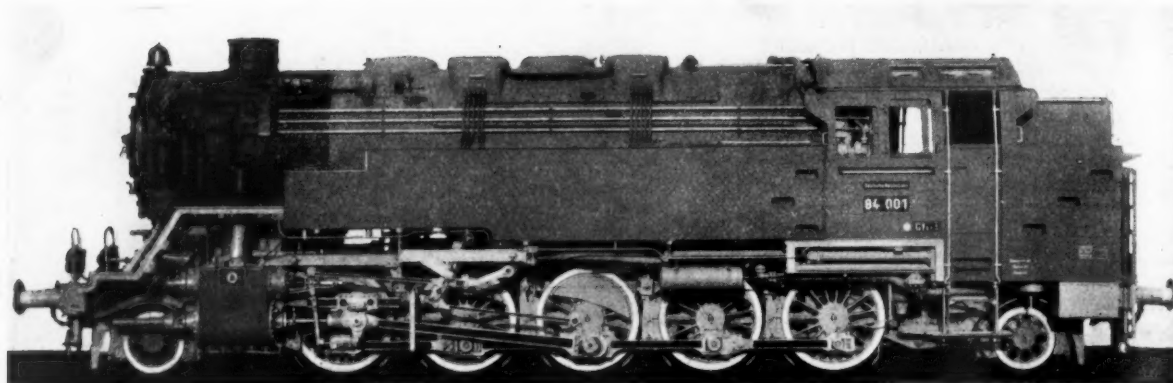
Brake hanger with provision for transverse displacement on curves

To make up for the fact that four of the coupled axles are capable of transverse displacement, the coupling rods between the 1st and 2nd, 4th and 5th coupled axles can be deflected horizontally about the driving axle, the coupling pins on the 2nd and 4th coupled wheel sets are lengthened to permit the necessary transverse displacement of the coupling rod bearings, and the bearing shells are given spherical seatings. The relatively highly stressed Obergethmann bearings on the driving axle are of the same type as is used in the Series 03 locomotives of the German State Railway, and the other axle-boxes are of the type used in the Series 86 engines.

At a maximum speed of 70 km. (43.5 miles) an hour,



Position of Schwartzkopff-Eckardt bissel on a curve



New Series 84 2-10-2 three-cylinder tank locomotive with Schwartzkopff-Eckardt bissel arrangement

the diameter of the driving wheels (1,400 mm. or 4 ft. 7 in.) corresponds to 265 r.p.m. and a piston speed of about 5.8 metres per sec. (1,142 ft. per min.) but it is intended to increase the maximum speed to 100 km. (62.1 miles) an hour, corresponding to 379 r.p.m. of the driving wheels and a piston speed of 8.3 metres per sec. (1,634 ft. per min.), values which have proved unobjectionable in trial runs of the 4-6-4, three-cylinder, streamlined locomotive Series 05.

The boiler of the Series 85 locomotives, with a heating surface of 193.3 sq. metres (2,080 sq. ft.), being too small for the output required from the new tank locomotive, a new boiler was developed, utilising the dies of the Series 43, 2-10-0 two-cylinder, standard goods locomotive. It has 48 flues of 125/133 mm. (4.92/5.24 in.) diameter, and 158 tubes of 46/51 mm. (1.81/2.01 in.) diameter.

As in the other recent experimental locomotives, of Series 05, 06, 41, 45, 61 and 71, the boiler working pressure is 20 at. (284 lb. per sq. in.) gauge. The molybdenum steel (0.5 per cent. Mo) used in its construction combines a minimum tensile strength of 48 kg. per sq. mm. (30½ tons per sq. in.) with high fatigue strength and well maintained yield point at high temperatures. The completely welded firebox is of softer molybdenum steel (K 35). The boiler barrel consists of two plates riveted to each other and to the outer firebox. The seatings are welded on, as in the standard locomotives, excepting the fastening plates for the flexible stay plate which are riveted. The inner firebox is connected to the outer by expanded steel (St C 10-61) stays of 23 mm. (0.91 in.) thread diameter; the stays and all tubes are welded to the firebox.

Full utilisation of material, and extensive application of welding were required in order to obtain a greater heating surface than in the Series 85 locomotives, and sufficient water and fuel capacities, without exceeding 18.5 metric tons (18 tons 4 cwt.) axle loading. All frame connections are welded, and the water tanks and the bunker are of all-welded 4 mm. (½ in.) sheet construction, notwithstanding the complicated form necessitated by space restrictions.

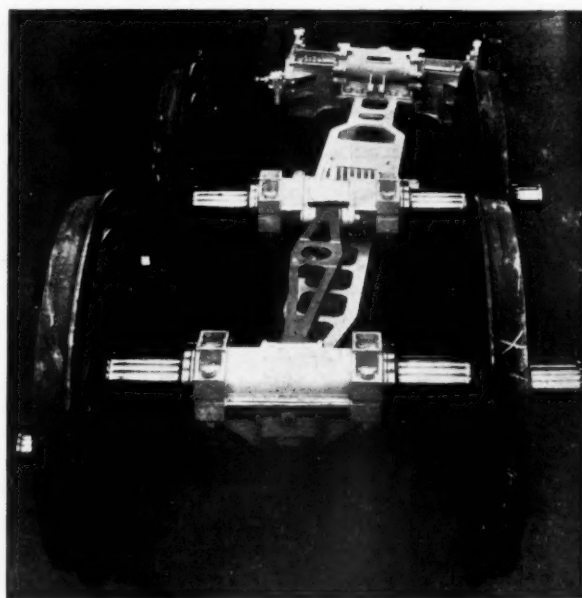
Brakes and Equipment

Special importance attaches to the braking gear, in view of the severe gradients to be negotiated. The double-side brakes for the carrying axles, each with a 10 in. brake cylinder, are as in the Series 71 locomotives. In either direction of running, the leading axle is braked to the extent of 50 per cent., and the trailing axle to the extent of 80 per cent. the change-over on reversing being effected automatically from the reversing gear handwheel. The brakes on the coupled wheels are arranged in two independent groups, those on the 1st and 2nd pair of coupled wheels being actuated by a 14 in. brake cylinder,

while those on the other coupled wheels are operated by two 12 in. brake cylinders. With full tanks and bunker, the braking of the coupled axles is 72.4 per cent., or 89.5 per cent. using the supplementary 5 at. (71 lb.) brake; with one quarter of the full water and coal supplies, the corresponding figures are 80 and 98.8 per cent. respectively.

All the brake shoes are in two parts, and in order to allow for transverse displacement of the coupled axles, the brake hangers are capable of similar displacement and are moved by an attachment on the corresponding axle to keep the brake shoes clear of the flanges when running on curves. A Riggensbach back-pressure brake relieves the wheel brakes when running down long declines. Compressed air sanding gear is provided for both sides of all the coupled wheels.

The general equipment of the locomotive includes a 0.5 kW. turbine-driven lighting generator, feed-water heater with Knorr-Tolkien feed pump, feed-water purifier, steam jet pump, drop gate, steam heating equipment, automatic valve and cylinder lubrication, speedometer, steam whistle and compressed air bell, all as usual in standard locomotives of the German State Railway; also, flange lubrication for the leading and trailing wheels.



Schwartzkopff-Eckardt bissel arrangement

RAILWAYS AND ROAD TRANSPORT SECTION

Railway Shareholdings in Passenger Road Transport

FROM the annual reports of the four group railways we have, as usual, extracted the information regarding the investments in various passenger road transport companies. There have been relatively few changes and, with the exception of the Southern Railway, the net result has been to reduce slightly the totals of these investments. With regard to passenger road transport the sums invested in associated bus undertakings, and the earnings during the year ending December 31, 1935, are as summarised below:—

	Investment			Earnings, 1935		
	£	s.	d.	£	s.	d.
L.M.S.R.	2,915,494	12	3	242,786	7	11
L.N.E.R.	2,329,728	3	10	196,667	15	11
G.W.R.	2,071,154	7	7	153,208	2	4
S.R.	1,640,466	2	1	—	—	—

The total shown as the investment is the actual amount of cash spent on the purchase of the shares and on that account will not agree with the sum of the holdings showing in the accompanying table as some of the shares cost more, or less, than their par value. Although the invest-

ments of three companies have been reduced, it will be noticed that the dividends received during the year show a substantial increase. The Southern Railway total investment is £239,621 8s. 10d. in advance of the 1934 figure, but it may be recalled that there was then a reduction of more than £400,000 on the previous year's figure.

A scrutiny of the L.M.S.R. investments shows that the holding in the Eastern National Company is now all in ordinary shares, a conversion which resulted in a credit of £6,952 16s. 3d. and another transaction involving a credit of £2,625 was the reduction of the £1 shares in the Highland Transport Co. Ltd. to 17s. each. Increases in the number of shares held may be noted as follow: East Midland 4,167; Lincolnshire 1,998; Ribble 660; Trent 368; West Yorkshire 22,382; Yorkshire Traction 12,263; and Yorkshire Woollen 23,333. Under the heading "Subscriptions to other undertakings" are the following items: East Midland Motor Services Limited £4,136 18s. 4d.; Lincolnshire Road Car Co. Ltd. £1,993 11s.; Ribble Motor Services Limited £2,169 19s. 2d.; Trent Motor Traction

Associated Company	Issued Share Capital	L.N.E.R.		L.M.S.R.		G.W.R.		S.R.
		Holding	Earnings	Holding	Earnings	Holding	Earnings	
		£	£ s. d.	£	£ s. d.	£	£ s. d.	
Aldershot & District Traction Co. Ltd.	200,000 Ord.	—	—	—	—	—	—	•
W. Alexander & Sons Ltd.	200,000 Ord.	50,000	25,000 0 0	50,000	25,000 0 0	—	—	—
Birmingham & Midland Motor Omnibus Co. Ltd.	700,000 6% Part. Pref.	175,000	—	175,000	—	200,000	30,000 0 0	—
City of Oxford Motor Services Limited	1,000,000 Ord.	—	—	300,000	45,000 0 0	—	—	—
	100,000 8% Cum. Pref.	—	—	—	—	70,875	10,225 15 3	—
	141,750 Ord.	—	—	—	—	—	—	—
Crosville Motor Services Limited	74,000 6½% Cum. Pref.	—	—	—	—	—	—	—
Cumberland Motor Services Limited	955,000 Ord.	—	—	357,724	28,617 18 5	119,241	9,539 5 7	—
Devon General Omnibus & Touring Co. Ltd.	125,000 Ord.	—	—	41,666	4,166 12 0	—	—	—
	200,000 Ord.	—	—	—	—	40,917	5,114 12 6	•
	150,000 7% Cum. Pref.	—	—	—	—	—	—	•
Eastern Counties Omnibus Co. Ltd.	672,069 Ord.	163,243	9,794 11 7	22,419	1,345 2 10	—	—	—
	200,000 5% Cum. Pref.	—	—	—	—	—	—	—
Eastern National Omnibus Co. Ltd.	700,000 Ord.	175,000	11,865 1 1	175,000	11,864 11 1	—	—	•
East Kent Road Car Co. Ltd.	350,000 Ord.	—	—	—	—	—	—	•
	200,000 6½% Cum. Pref.	—	—	—	—	—	—	•
East Midland Motor Services Limited	125,000 Ord.	41,666	3,880 13 1	20,834	1,940 8 2	—	—	—
East Yorkshire Motor Services Limited	240,000 Ord.	119,490	11,949 0 0	—	—	—	—	—
Hants & Dorset Motor Services Limited	320,000 Ord.	—	—	—	—	—	—	•
	150,000 6½% Cum. Pref.	—	—	—	—	—	—	•
Hebble Motor Services Limited	100,000 Ord.	12,500	1,875 0 0	37,500	5,625 0 0	—	—	—
Highland Transport Co. Ltd.	35,000 Ord.†	—	—	17,500	875 0 0	—	—	—
Lincolnshire Road Car Co. Ltd.	125,000 Ord.	39,951	3,772 7 3	9,989	943 4 1	—	—	•
Maldstone & District Motor Services Limited	416,620 Ord.	—	—	—	—	—	—	•
	200,000 6½% Cum. Pref.	—	—	—	—	—	—	•
Northern General Transport Co. Ltd.	554,053 Ord.	243,815	24,467 15 11	—	—	—	—	•
	300,000 6½% Cum. Pref.	—	—	—	—	—	—	•
North Western Road Car Co. Ltd.	600,000 Ord.	99,555	12,444 7 6	199,110	24,888 15 0	—	—	—
Ribble Motor Services Limited	600,000 Ord.	—	—	264,742	26,419 16 4	—	—	—
	200,000 6½% Cum. Pref.	—	—	—	—	—	—	—
Scottish Motor Traction Co. Ltd.	746,690 Ord.	214,609	22,498 4 3	214,608	28,406 17 10	—	—	•
	1,000,000 6½% Cum. Pref.	—	—	106,863	—	—	—	•
Southdown Motor Services Limited	426,250 Ord.	—	—	—	—	—	—	•
Southern National Omnibus Co. Ltd.	542,200 Ord.	—	—	—	—	—	—	•
Southern Vectis Omnibus Co. Ltd.	55,000 Ord.	—	—	—	—	—	—	•
	15,200 6% Cum. Pref.	—	—	—	—	—	—	•
Thames Valley Traction Co. Ltd.	150,000 Ord.	—	—	—	—	51,115	3,833 12 6	•
Trent Motor Traction Co. Ltd.	268,000 Ord.	37,027	3,686 8 7	74,057	7,372 15 4	—	—	—
United Automobile Services Limited	984,375 Ord.	482,607	41,197 8 4	—	—	—	—	—
	150,000 7% Cum. Pref.	38,769	—	—	—	—	—	—
Western National Omnibus Co. Ltd.	1,453,926 Ord.	—	—	—	—	726,963	81,154 16 6	—
	400,000 6% Cum. Pref.	—	—	—	—	400,000	—	—
Western Welsh Omnibus Co. Ltd.	348,000 Ord.	—	—	—	—	174,000	13,340 0 0	—
West Yorkshire Road Car Co. Ltd.	540,000 Ord.	134,291	12,310 0 0	134,291	12,310 0 0	—	—	—
	200,000 6½% Pref.	—	—	—	—	—	—	•
Wilts & Dorset Motor Services Limited	100,000 Ord.	—	—	—	—	—	—	—
Yorkshire Traction Co. Ltd.	250,000 Ord.	61,304	5,843 11 4	61,305	5,843 13 10	—	—	—
	24,350 7% Pref.	4,662	—	4,662	—	—	—	—
Yorkshire Woollen District Transport Co. Ltd.	400,000 Ord.	66,667	6,083 7 0	133,333	12,166 13 0	—	—	—

* The Southern Railway investments in passenger road transport undertakings are not charged to capital account and so do not appear in detail in the annual accounts. In most cases the Southern Railway holds approximately 30 per cent. of the issued share capital, but the proportion is about 50 per cent. in the cases of the Southern National (271,100) and Southern Vectis companies, and about 20 per cent. in the case of the Devon General concern, where the G.W.R. holds about 30 per cent.

† Highland Transport Co. Ltd. shares are 17s. each.

Railway Shareholdings in Road Transport



Sketch map showing the approximate areas served by the railway-associated omnibus companies in England and Wales.
Details of the railway shareholdings in these companies will be found on the preceding page

Co. Ltd. £953 14s.; West Yorkshire Road Car Co. Ltd. 9s.; and Yorkshire Traction Co. Ltd. £5. It is estimated that £40,000 will be subscribed to road transport undertaking in 1936.

The holding of preference shares of the L.N.E.R. in the Eastern National Company has likewise been converted so that a credit of £6,952 16s. 3d. is shown, while the disposal of the preference shares in Northern General brought in £13,287 0s. 1d., and a further credit of £106,159 14s. 8d. marks the disposal of the preference shares in Scottish Motor Traction. The holdings of ordinary shares have been increased as follow: East Midland 8,333; East Yorkshire 19,915; Lincolnshire 7,990; Trent 182; United Automobile Services 54,273 (and 1,814 cum. pref.); West Yorkshire 22,382; Yorkshire Traction 12,262; and Yorkshire Woollen 11,667. Payments on these accounts included: East Midland £8,272 16s. 10d.; Lincolnshire £7,972 3s. 8d.; Trent £472 5s. 7d.; United Automobile Services £4,634 13s. 9d.; West Yorkshire 11s. 6d.; and Yorkshire Traction £3. The L.N.E.R. has earmarked £42,000 for this purpose this year.

In the G.W.R. accounts it appears that the holding of preference shares in the City of Oxford Motor Services has been relinquished, resulting in a credit of £54,881 18s. The holding of ordinary shares in Western National has been increased by 443,207 and the number of preference shares reduced by 443,387, and a credit of £5,779 8s. is shown. A further 29,000 ordinary £1 Western Welsh shares have been secured at par. The G.W.R. estimates that £375,000 will be subscribed to road transport undertakings during the current year.

Shareholdings in Freight Concerns

The published holdings of the various companies in freight handling concerns are collated in a separate table. The investment in Carter Paterson & Co. Ltd. is shown by each of the four companies as £335,748 17s., but the Hay's Wharf amounts vary slightly as follow: L.N.E.R. 209,990 18s. 9d.; L.M.S.R. £210,243 8s. 9d.; G.W.R. £210,058 13s. 9d.; and S.R. £209,990 18s. 9d. The L.N.E.R. investment in Currie & Co. is given as £84,808 4s. 1d., while those of the L.M.S.R. in Joseph Nall & Co. and Wordie & Co. are set out as £71,761 and £100,000 respectively. Each of the group companies shows a payment of £13 10s. in respect of Carter Paterson & Co. Ltd. It will be noticed that all the returns are increased, those of Carter Paterson show £1,265 more, the Hay's Wharf investments have each yielded £1,058 10s. 8d. more, the Nall dividend was nearly double that of the previous year, the Wordie return increased by £2,500, and the Currie increase was £318 15s.

Recently, Pickfords Limited has acquired control of Chaplins Limited and of Garlick, Burrell & Edwards Limited. The present company of Chaplins Limited was incorporated on April 21, 1926, but the business is the successor of a famous coaching enterprise which was disposed of in the early days of railways, (see the editorial

While on this subject it may be recorded that the holdings of Thomas Tilling Limited and British Electric Traction Co. Ltd., in Tilling & British Automobile Traction Limited, are equal, and that the two first-named companies between them hold over 90 per cent. of the capital of Tilling & B.A.T. which, with the grouped railways, controls a large number of important motorbus companies. Each company has four representatives on the board and in future the two groups will nominate the Chairman alternately; the casting vote of the Chairman has been cancelled. Mr. John F. Heaton, Chairman and Managing Director of Thomas Tilling Limited, has been elected Chairman for the ensuing year, in succession to Mr. Sidney E. Garcke. The accounts of Thomas Tilling Limited for 1935 show that at the end of that year, 1,247,519 ordinary and 35,583 8 per cent. cumulative participating preference shares, each of £1 were held in Tilling & British Automobile Traction Limited, and 564,828 ordinary and 13,441 7 per cent. cumulative preference shares, each of £1, in the National Omnibus & Transport Co. Ltd.

It should also be noted that since the end of last year the capital of the Western National Omnibus Co. Ltd. has been increased by 329,650 ordinary shares of which one half has been taken by the G.W.R. and the other half by the National Omnibus & Transport Co. Ltd. The following companies controlled by Tilling & British Automobile Traction Limited have their issued ordinary capital increased to the following: Crosville £1,100,000; East Midland £156,250; Lincolnshire £149,981; Maidstone £500,000; Ribble £800,000; Trent £375,200; and United Automobile £1,107,422.

article on pages 956-7 of our issue of December 6 last), and has since been closely associated with various railways as a cartage agent. The present issued capital is £33,002, and the rolling stock includes about 50 motor vehicles as well as many horse vans. The new directors are Sir Josiah Stamp, Sir James Milne, Sir Herbert Walker, and Sir Ralph Wedgwood, the general managers of the four main-line railways, who are also directors of Pickfords Limited. The former directors, W. A. Chaplin (Managing), B. E. Chaplin, and P. M. Chaplin, have resigned.

Garlick, Burrell & Edwards Limited was incorporated on October 4, 1901, and has headquarters at Liverpool, with branches at Glasgow, Newcastle-on-Tyne, Leeds, Coventry, Birmingham, Widnes, and Manchester. Its fleet includes over 130 lorries and vans. The new board of directors consists of Mr. E. J. H. Lemon (a Vice-President, L.M.S.R.); Mr. William J. Elliott (General Manager, Pickfords Limited); Mr. O. H. Corble (Assistant to the Chief General Manager, L.N.E.R.); Charles Bostock (Secretary, Pickfords Limited); and Mr. William J. Cornes (also Secretary, and the present General Manager of Garlick, Burrell & Edwards Limited). The members of the former board, Messrs. William Bentley, Noel Brown, and Arthur G. Roberts, have resigned.

Associated Company	Issued Share Capital	L.N.E.R.		L.M.S.R.		G.W.R.		S.R.	
		Holding	Earnings	Holding	Earnings	Holding	Earnings	Holding	Earnings
Carter Paterson & Co. Ltd.	506,008 Ord. 365,000 6% Cum. Pref.	126,502 91,250	£ s. d. 18,125 4 0	126,502 91,250	£ s. d. 18,125 4 0	126,502 91,250	£ s. d. 18,125 4 0	126,502 91,250	£ s. d. 18,125 4 0
Hay's Wharf Cartage Co., Ltd. (controlling Pickfords)	138,292 Ord. 211,708 Pref.	52,927 32,910	8,325 16 9	52,927 33,160	8,340 16 8	52,927 32,977	8,329 17 2	52,927 32,910	8,325 16 8
Currie & Co. (Newcastle) Ltd.	14,800	63,750	4,462 10 0	—	—	—	—	—	—
Joseph Nall & Co. Ltd.	Ordinary	—	—	35,106	938 16 6	—	—	—	—
	5% Cum. Pref.	—	—	10,000	—	—	—	—	—
Wordie & Co. Ltd.	—	—	—	100,000	6,500 0 0	—	—	—	—

The Railways and Road Transport

In addition to the information given on the preceding pages, the publication of the annual reports of the four grouped railways provides an opportunity to indicate something of the extent to which motor vehicles are being used directly by the railways. In the following table is shown the amount of capital expended on parcels and goods motors up to the end of 1934, the amount so spent last year and what has been set aside for the purpose this

year. The stock of motors, carts and horses possessed by each company is shown and the figures for the previous year so that the changes may be noted. The table also includes the figures shown for the maintenance of motors, carts and horses under the heading of "road transport" as well as those which are given for the vehicles engaged on "collection and delivery" work, as well as the licence duty paid.

	L.M.S.R.			L.N.E.R.			G.W.R.			S.R.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
<i>Capital expended to December 31, 1934—</i>												
Parcels and goods vehicles	1,159,377	5	6	1,112,537	5	9	1,073,474	1	2	167,608	10	2
Horses	—	—	—	—	—	—	90,030	9	0	36,647	0	1
Passenger vehicles	171,780	14	2	60,979	7	4	—	—	—	—	—	—
<i>Capital expenditure during 1935—</i>												
Parcels and goods motors	18,755	17	10	68,342	5	5*	27,434	15	5	—†	—	—
Horses	—	—	—	—	—	—	—†	—	—	—	—	—
Passenger vehicles	5,467	17	9	2,414	10	10	—	—	—	—	—	—
<i>Capital expenditure during 1936—</i>												
Parcels and goods motors	63,000	0	0	5,000	0	0	75,000	0	0	—†	—	—
Passenger vehicles	14,000	0	0	—	—	—	—	—	—	—	—	—
<i>Vehicles and horses—</i>												
1935	1934	1935	1934	1935	1934	1935	1934	1935	1934	1935	1934	
Parcels and goods motors	2,727	2,499	3,033	2,791	2,010	1,860	563	505				
Horse wagons and carts	16,000	16,144	5,593	6,239	3,144	3,335	1,167	1,222				
Miscellaneous	919	871	869	662	556	345	141	92				
Passenger motors	115	117	43	44	—	—	—	—				
Horses (road work)	8,196	8,123	2,483	2,901	1,787	1,911	781	85				
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
<i>Maintenance, Road Transport—</i>												
Motor vehicles	76,085	10	3	16,424	18	2	12,964	17	8	2,643	11	2
Horses	2,255	2	0	1,176	4	4	200	11	0	—	—	—
Horsed vehicles	454	2	4	428	2	2	49	9	2	—	—	—
Licence duty	20,920	11	7	7,481	1	0	5,985	17	4	1,381	5	4
<i>Maintenance, Parcels and Goods—</i>												
Motor vehicles	219,892	4	11	125,717	6	6	176,310	19	2	63,295	10	10
Horses	484,330	19	9	151,662	18	9	126,258	9	9	61,586	2	2
Horsed vehicles	143,197	14	2	35,565	2	1	20,577	15	11	11,107	6	1
Licence duty	115,599	10	4	93,811	5	8	85,099	4	2	28,843	7	6
<i>Deposit under Road Traffic Act, 1930</i> ..	15,000	0	0	18,667	18	5	15,000	0	0	—†	—	—

* Less a credit of £14,522 13s. for horse vehicles withdrawn.

† Credit of £4,721 15s. on account of horses disposed of.

‡ Expenditure under these heads not charged to capital account since 1932.

Publications Received

Public Control of Road Passenger Transport. By D. N. Chester. Manchester: Manchester University Press, 8-10, Wright Street. 9 in. x 5½ in. 226 pp. Price 8s. 6d. net.—When on April 1, 1931, the provisions of the Road Traffic Act, 1930, as regards the licensing of passenger vehicles came into operation, the whole structure for the public control of road transport underwent a fundamental change. Prior to that date there had been little control except on the part of some of the larger local authorities and in the Metropolitan area. At the same time, examples were to be found where the close proximity of a large number of local authorities resulted in excessive control and even in conflicting requirements. It is necessary to recall these facts in order to appreciate the nature of the ground covered by Mr. Chester in this valuable volume. It bears the subtitle, "A Study in Administration and Economics" and this sufficiently indicates its difference from previous volumes dealing with the effects of the Road Traffic Act, 1930, as the latter have been concerned mainly with legal aspects.

The author has clearly stated the issues raised by the operation of publicly controlled industries, namely: what reasons make control desirable and practicable; what control methods were adopted; what effects these have had on the

structure of the industry; what public gain has resulted; and what substitute can be found for the pressure towards efficiency which results from competition. He answers these in part by describing in Part I the structure of the industry (both of local authority and private operation) and the nature of the various road services, such as stage, express, excursion, and contract. Incidentally, this part is the clearest and most accurate statement on the subject we have yet seen.

Part II deals with the basis and nature of the existing statutory control. It takes the reader much further than a mere exposition of the purely legal position as provided by Acts of Parliament, Rules and Orders, and decisions of the Courts, by tracing voluntary tendencies within the industry which have resulted from the introduction of the present methods of licensing and control. For example, road fares are discussed both in relation to former competitive prices and present approximate standardisation, and also as compared with ordinary and other railway fares. A note on statistics and an adequate index conclude a volume which we have no hesitation in recommending to every student of transport, and also for inclusion in reference libraries and as a desk companion for those who require a lucid and well-presented study of a subject which is not overstocked with such useful and accurate guides.

Oil Engines for Road Transport

The merits of the compression-ignition engine were outlined by Major Goddard in a paper read at Nottingham. He also threw some light on maintenance costs

THERE will be many who will be grateful to Major Goddard for the able paper read by him at a joint meeting of the East Midland section of the Institute of Fuel and the Institution of Mechanical Engineers at Nottingham a week or two back, because while it was not couched in profoundly technical language it embodied sound practical experience. In his opening Major Goddard said it was fortunate that in its essentials—cylinders, pistons, valves, &c.—the diesel engine happened to be so similar to the familiar petrol engine. If it had been—as might well have happened—something quite distinct, it would have taken twice as long to get it accepted here. The growth in the number in use was shown by the fact that whereas in November, 1930, there were about 90 diesel vehicles in use, there are now something like 12,000. In twelve months, ending August, 1935, there were 3,876 diesel-engined vehicles licensed for the first time. Major Goddard went on to point out the progress made. Fuel consumption had been greatly improved, from about 0.50 lb. per b.h.p.-hour to 0.370 lb. and even better. Noise had been greatly eliminated and exhaust smoke was now almost a thing of the past. The range of engines had been increased enormously and now covered almost every vehicle requirement except light vans and small cars, in which connection reference was made to the flat-twin engine illustrated in these columns a few weeks ago. It was also mentioned that the London Passenger Transport Board has over 900 oil-engined vehicles running in London.

Major Goddard explained that the great progress had been assisted by the advantages of this type of engine in its increased thermal efficiency, its high specific fuel

economy and the safety factor—the immunity from fire danger, both on the road and in garages. Technical advantages arose from the fact that each cylinder of a multi-cylinder engine received an exactly equal and accurately measured charge of fuel and the fuel economy at fractional loads was of a very high order—the reverse of the carburettor engine. The low temperature of the exhaust gases tended to lower maintenance costs as there was less valve and seat wear and better lubricating conditions. Much less carbon was formed and decarbonising time and work was reduced by 50 per cent. or more.

On the matter of maintenance Major Goddard said that costs varied to a very great extent but his experience was that with the highest class of engines the maintenance costs were lower than with a petrol engine. As regards routine work, the absence of carburettors, magneto and sparking plugs and the fact that valves and seats required less attention meant that a good deal of time and expense was saved. The attention required by filters and sprayers was very much less than the routine work on a petrol engine. He also found that in the main work of maintenance, *i.e.*, cylinders, bearings, pistons and crankshafts there was less wear all round. The engines should be kept warm—at least up to 165 to 170° F.—the right viscosity of oil as prescribed by the makers must be observed and the centrifuging of the oil was beneficent. The use of thermostats and the fitting of hardened cylinder liners were recommended. Cylinder wear was stated to vary greatly under the varying conditions of load, driving, weather and contributory items, but from 3,500 to over 5,000 miles run per 0.001 in. wear could be obtained.



Part of the convoy of Vacuum Mobiloil lubricant for the R.M.S. "Queen Mary," passing through Carlisle on its way from Birkenhead to Clydebank. It will be noticed that the leading vehicles are two of the 3,600-gallon tankers on A.E.C. Monarch chassis of Pickfords Limited

Recently some very remarkable results have been obtained. A double-decked bus in Yorkshire ran 130,000 miles with the same cylinder blocks and the average wear was only 0.018 in. A multiwheeler lorry carrying a pay load of 12½ tons some 200 miles per day regularly, ran 82,000 miles for a cylinder wear of only 0.005 in. This was with a 5-cylinder 80 b.h.p. engine. No fan and no thermostat were used. Major Goddard thought the chief reason for this fine result was that the engine was kept warm almost the whole week, only being cooled off at week-ends. More interesting still were the crankshaft wear records. In a Northern city a double-decked bus on hilly routes, after a run of 145,000 miles (with a 6-cylinder 102-h.p. engine), showed barely 0.003 in. wear on the crankshaft. At this rate and allowing for a maximum limit of wear of 125 thousand, this shaft would last out for 40 or 50 years—some millions of miles. But, of course, before that crystallisation would set in and probably result in fracture. It would, however, almost surely last out for 20 years, which would be the life of the engine. Thus it would probably see two chassis out. Also in this case, the big end bearings lasted out the 145,000 miles, and except for slight flaking of the metal were quite fit to be put back again.

Discussing the matter of conversions, Major Goddard said that in spite of the heavy fuel tax imposed in April, 1935, it is still a very paying proposition to convert a petrol bus or lorry to diesel power, providing the mileage is sufficient to warrant the outlay, *i.e.*, provided the

economy obtainable will reimburse the owner in a reasonable period—say, within two years.

As passenger vehicles mostly run big mileages, it could be taken as a fact that for these vehicles it was always a paying proposition to convert to diesel power. Hence all big passenger vehicle undertakings are calling for diesel engines. With goods vehicles it was simply a matter of mileage run. Taking, for example, the six-ton lorry—and assuming a mileage of 600 per week, or 30,000 per year. This lorry would run about 6 m.p.g. with petrol and 14 to 16 with diesel. The petrol bill would come to £250 and the fuel oil bill to £100 per year. Thus, in five years there was a saving of no less than £750 in fuel alone. The cost of the diesel engine and the work of conversion would probably amount to about £350. Thus the haulage man could save a clear £350 in five years on fuel alone. Added to this were the many advantages already mentioned.

Major Goddard said this alone would make a very fine investment, but there is the added advantage that with the highest class of engine approximately 20 years' life could be counted upon, provided it is well maintained and looked after. This means that the engine would probably see two chassis out. If, however, a life of 10 years is assumed, there would be at least a clear saving of well over £1,000. As there are something like 200 such lorries newly licensed every month (*i.e.*, unladen weight, 4 to 5 tons)—there is ample scope for conversion work for years to come.

Rejuvenating Old Vehicles

ALTHOUGH the Leyland Lioness, shown in the accompanying illustration, has every appearance of a newly-built streamlined coach, the machine has covered more than 350,000 miles since its delivery in 1929. The first 100,000 miles were completed on an arduous route between Ripponden and Brighouse. In 1932, however, the chassis was mounted with a van body and was operated on regular daily parcel services throughout

Yorkshire and Lancashire until 1935. A rejuvenation was then accomplished by the fitting of a luxury streamlined coach body, built by the Oldham Construction Co. Ltd. Equipped with a sliding head, internal heating arrangements and a wireless set, the coach is now frequently used on the express service between Manchester and Halifax, and when necessary duplicates the stage carriage services run by its owner.



An interesting conversion of a Leyland Lioness, which after 100,000 miles was fitted with a body for parcels work. It has now been rejuvenated and fitted with the streamlined coachwork shown above

Road and Rail Co-ordination

Some developments which have taken place in different parts of the world in the last year or so. The insistence upon public necessity in most countries

SINCE the comprehensive volume, "Road and Rail in Forty Countries," was published a year or so ago on behalf of the International Chamber of Commerce there have been several changes in some of the countries, and in the current issue of *World Trade*, the journal of the International Chamber, the changes are summarised, so forming a useful supplement to the book.

It is pointed out that as regards these latest changes there is a constantly increasing tendency to subordinate authorisations for the establishment of new services to prove that they really correspond to a public necessity. Further, more often than not regulations are made to apply exclusively to what is termed professional motor transport and in most cases, long distance transport, at least as far as goods traffic is concerned. There is also the tendency on the part of the authorities to extend to public motor carriers the obligations imposed upon railways as to the publication of rates, non-discrimination, and in some cases an obligation to carry, while certain obligations on the railways have been rendered less onerous. Among the changes may be noted the following.

United States of America.—The transport of passengers and goods as regards interstate traffic, is regulated by the Motor Carrier Act, 1935, which requires common carriers to have a "certificate of public convenience and necessity" while contract carriers for reward have to have a permit. Certificates and permits are issued by the Interstate Commerce Commission subject to proof by the applicant of public convenience and necessity and that he is able to perform the service in the required conditions. The tariffs of common carriers must be published and no discrimination is allowed, wide powers of appreciation and intervention as regards rates being vested in the Commission.

Germany.—The law of December 4, 1934, on passenger transport by road and that of June 26, 1935, on long-distance goods transport by road amended the earlier regulations instituted by the decree of October 6, 1931. The system of permits is maintained for regular passenger services and extended to occasional services. A permit is also necessary for goods transport exceeding 50 kilometres. In both these cases, permits are now granted only if it is proved that the proposed service is of public utility and the carrier can guarantee his ability to perform the service. The Postal Administration and the State Railway are exempted, but in their case the Transport Ministry is empowered to intervene if deemed necessary. The latest measure consists in the constitution of an Association of Motor Truck Carriers controlled by the Transport Ministry to which all enterprises carrying goods over distances exceeding 50 kilometres are obliged to adhere. This association is independent of the State Railway. Its duties are to allocate carrying capacity, to collect and regulate the price of transport, to provide for insurance of the goods carried, and to verify that its members fulfil their obligations. It also fixes the rates in agreement with the State Railway. Failing agreement, the decision lies with the Transport Minister. Goods and passenger tariffs must be published; there must be no discrimination; tariffs must be endorsed by the Minister. Transport Commissioners are responsible for the application of goods tariffs.

Austria.—It is necessary to mention the creation, in 1935, of the R.O.N.A. (Austrian Co-operative Society for

cartage, short-distance transport and forwarding) which has, by an agreement made between the railways and the transport commissioners, apportioned short-distance traffic (not exceeding 50 km.) between road and rail. Further agreements for the division of traffic over longer distances are envisaged with lorry carriers and regular motor services.

France.—Co-ordination is proceeding under the decree of April 19, 1934, and we have recorded in these pages several of the regional agreements for the closing of non-profitable railway lines and the organisation of road services in their place. The decree provides for the creation of a Co-ordination Committee consisting of an arbitrator and five experts, each representing a particular type of transport. Two further decrees of February and July, 1935, deal with passenger and goods traffics respectively. Local Committees of five assist in the preparation and carrying-out of the agreements. The agreements fix maximum tariffs, routes and frequency of service for passenger work. For goods transport carriers have to obtain a card, according to whether the service is short, medium or long distance and a tax based on kilometre-tonnes is payable, the tax varying according to the merchandise carried. The short distance carriers pay fees on bulk consignments. Rates must be published and are not subject to discrimination.



Road and rail co-ordination in Germany. One of the trucks for carting railway wagons through the streets, with its tipping gear in operation

A Road Travel Saving Club


WITH a view to co-ordinating and regularising the long-established unofficial systems of paying for road-travel by instalments, London Coastal Coaches Limited, a railway-associated concern, has this week introduced a scheme of saving for travel, generally similar to those recently announced by the L.M.S., L.N.E., and Southern Railways which were described in THE RAILWAY GAZETTE for January 24 and February 21.

For publicity purposes the scheme, which involves the issue of savings cards upon which 36 special stamps of one-shilling value may be fixed, is to be known as the London Coastal Coaches Limited Travel Club. The savings cards are to be obtainable from both the company's own booking offices and also those of accredited agents. The stamps, which are of attractive design and are printed in blue and red, are being issued to agents in books of 100 each. Stamps sold from these books are accounted for week by week, but commission is allowed only on the sale of a ticket or tickets in exchange for stamps saved, and not on the sale of the stamps. This is necessary as the commission allowed varies according to the nature of the booking, and the stamps are exchangeable for any type of ticket.

If the value of the stamps on the card is in excess of the price of the ticket required, the agent will be re-

requested to sign for the savings card and forward it to the London Coastal offices; in exchange a franked card will be sent for the amount of the overpayment to be returned to the passenger. All questions that may arise as to refunds have also to be referred to head office. Our illustration shows the business side of the savings card.

LONDON COASTAL COACHES LTD.



SAVE YOUR SHILLINGS

PRIVATE HIRE

PARTICULARS OF TICKETS ISSUED

Nos.	Destination	Travel Date	Value

"ALL-WAYS"

Two corners of the savings card. There are 20 spaces for stamps on the one side and sixteen on the other. The stamps may be used for all types of ticket and for payment of private hire charges

Motor Services in South Africa

It is clear that the Administration of the South African Railways and Harbours is determined to make use of the



One of the Thornycroft double purpose vehicles for carrying passengers and freight which are doing such good work on the road motor services organised by the South African Railways and Harbours



latest methods in developing the road motor services which have done such good work in feeding the railways in various parts of the Union. More extended use is evidently to be made of tractors working in conjunction with a large number of trailers. It may be remembered that recently a number of the Karrier Cob mechanical horse tractors were put into service, and we are now informed that among recent orders placed in this country is one for 17 petrol-engined tractors, having a 9 ft. 0 in. wheelbase, from Leyland Motors Ltd. Tractors are being used by the South African Railways in Capetown, Durban and Johannesburg and it is probable that most of these Leyland tractors will be employed in the last-mentioned district. Besides being the centre of the Witwatersrand gold fields, there is a steadily increasing commercial activity in and around Johannesburg. Brickmaking, brewing, tobacco manufacture and iron founding are among the chief industries. In the transhipment of goods to and from the railway the tractors play a large part, drawing as many as four trailers (although the number may be limited by law to two) the trailers being parked for loading or unloading, the tractors being engaged meanwhile.

NEW 2-8-2 LOCOMOTIVES FOR NEWFOUNDLAND

The first modern type locomotives shipped from Britain to Newfoundland have been recently built by the North British Locomotive Co. Ltd., and are now in service

TWO 2-8-2 locomotives have recently been constructed by the North British Locomotive Co. Ltd., for the Newfoundland Railway to the requirements of Mr. J. F. Pike, the Superintendent of Motive Power, and under the supervision of the Crown Agents for the Colonies in London. The service on which these locomotives will be largely used is in hauling paper pulp from the mills to the shipping ports. The island, which is 317 miles long and 316 miles wide has a rugged coast line extending to over 4,000 miles, with ramparts of rock 300 to 400 ft. high. The Long Range mountains along the west coast rise to peaks of 2,300 ft., and the railway system which totals 740 route miles consists mainly of the cross country line from St. John's in the south-east to Port-aux-Basques in the south-west, 546 miles long of almost continuously and in many places steeply graded 3 ft. 6 in. gauge track.

The boiler barrel has an external diameter of 4 ft. 11½ in. at the front and 5 ft. 5 in. at the throat plate, the front barrel plate being coned. The round-top firebox is 7 ft. 9½ in. long outside by 5 ft. 9 in. wide at the foundation ring. The tubes and inner firebox are of steel, and there are two thermic syphons in the latter, the firegrate of which is of the rocking type with a drop plate at the front end. The superheater is of the Superheater Company's multi-valve header type with 21 elements. The bar frames are well stayed by stretchers of cast steel and are supported on overhung bearing springs on the coupled wheels, with compensating beams between the front truck, the leading and the intermediate coupled wheels, and between the driving and trailing coupled wheels and the rear truck. The latter is of the radial type with side check spring gear, the axle bearings and overhead bearing springs being arranged outside the wheels. The front truck is of the swing bolster type with three pin links, coil bearing springs and axle bearings inside the wheels. To provide flexibility on curves the leading coupled wheels have spring controlled lateral movement.

Walschaerts valve gear, lever-operated from the cab, actuates 8 in. diameter piston valves which are cast together with the cylinders and the smoke box saddle and jointed at the centre line. The tenders are of the double bogie type with channel bar frames and tanks of fabricated construction. They are carried on cast steel bogie frames to which the axle boxes are attached. The bearing springs four in a group are interposed between cross bolsters and the bogie framing.

These locomotives follow in main design others already in use on the Newfoundland Railway, but incorporate the most modern equip-

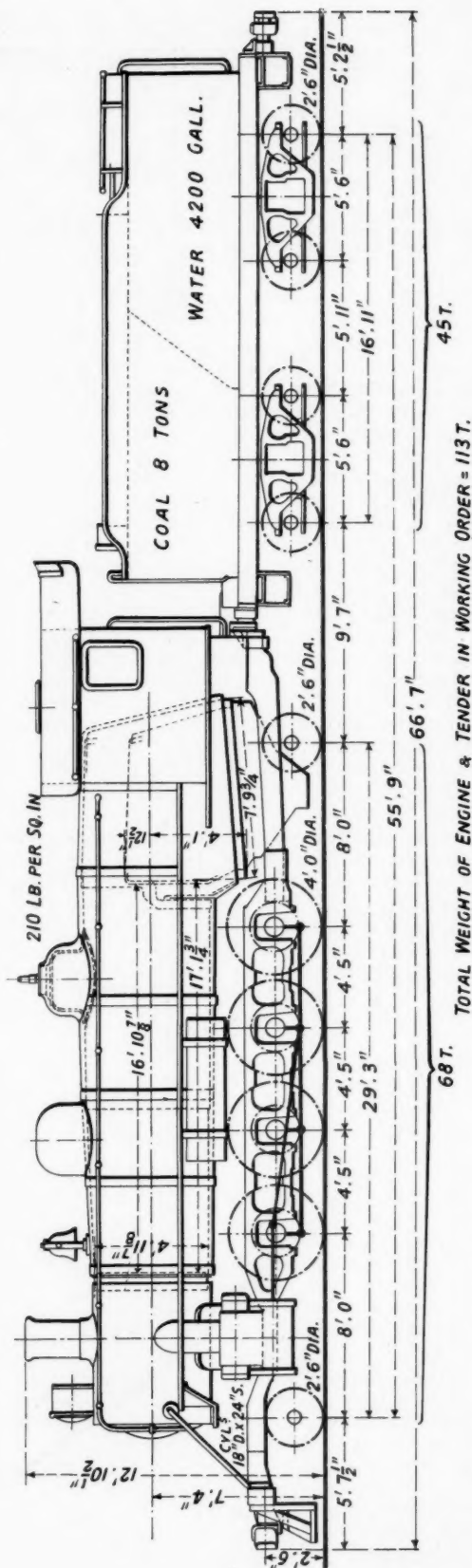
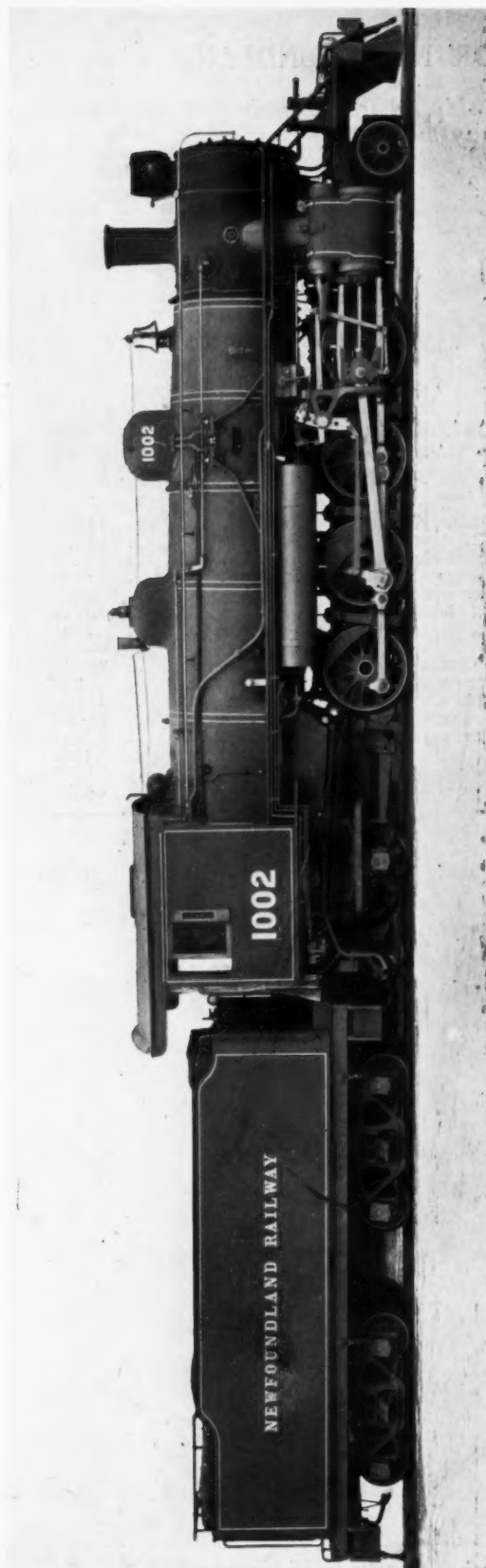
ment, including Westinghouse brake on engine and tender, central couplers, electric lighting equipment, two injectors and stop valves, an ejector and syphons for filling the tender tanks from lakes or streams, steam heating apparatus, compressed air sanding apparatus, pop safety valves, mechanical lubricator for the cylinders, grease lubricators to the coupled axle boxes, connecting, coupling and eccentric rods. Magnesia blocks are used for boiler and cylinder insulation. The overall width of these 3 ft. 6 in. gauge locomotives is 9 ft., and other dimensions are shown on the diagram overleaf.

The principal dimensions of the new locomotives, which were shipped in parts from Liverpool to St. John's, are as follow:—

Cylinders, diameter	18 in.
stroke	24 "
Coupled wheels, diameter	4 ft. 0 in.
Leading and trailing wheels, diameter	2 ft. 6 in.
Boiler working pressure	210 lb. per sq. in.
heating surface	1,754 sq. ft.
(superheater)	340 "
Combined total	2,094 "
Grate area	35.2 "
Weight of engine in working order	113 tons
Adhesion weight	52.5 tons
Tender capacity, water	4,200 galls (Im.)
fuel	8 tons
Tractive effort (at 85 per cent.)	28,920 lb.
Factor of adhesion	4.07



Sketch map of the railways of Newfoundland



General arrangement of new 2-8-2 locomotives built by the North British Locomotive Co. Ltd. for service on the 3 ft. 6 in. gauge railways of Newfoundland. The locomotives were shipped from Liverpool, and the boilers, frames, tanks, &c., were transferred on arrival at St. John's to lighters and transported to the railway shops near the railway terminus at the west end of St. John's Harbour, where they were re-erected. (See article on page 521)

RAILWAY NEWS SECTION

PERSONAL

Mr. Robin Stuart, who, as announced in *THE RAILWAY GAZETTE* of January 3, is retiring this month from the position of Commercial General Manager, Buenos Ayres Great Southern and Buenos Ayres Western Railways, began

in 1919 was appointed Assistant General Manager of the B.A.G.S.R. In January, 1928, he joined the B.A. Western Railway as General Manager, prior to becoming General Manager of the B.A.G.S.R. in July, 1930. It was in May, 1935, that he was appointed Commercial General Manager of the

Victorian Government Railways. In 1903 he returned to England, and was engaged on the electrification of Underground railways in London. After three years in England, Mr. Roberts went to Argentina as Assistant Works Manager with the B.A. Western Railway at Liniers, and in 1907 was trans-



Mr. R. Stuart,
Commercial General Manager,
B.A.G.S. and B.A.W. Railways, 1935-6



Mr. C. A. Roberts,
Technical General Manager,
B.A.G.S. and B.A.W. Railways, 1935-6

his railway career in 1897, with the Argentine Great Western Railway. After experience in traffic and station working, he became Stationmaster at Mendoza, the headquarters of the system in 1903, and, later in the same year, joined the Central Argentine Railway Traffic Department, where he gained further experience as Sectional Chief Clerk and Traffic Inspector. Three years later Mr. Stuart entered the service of the Entre Rios Railways, and there rose to be Commercial Agent in Buenos Aires (1908), Acting Traffic Superintendent (1909), Assistant to the General Manager (1910), and Assistant General Manager (1911). In 1912 he took over, additionally, the duties of Traffic Manager. Some two years later Mr. Stuart became Traffic Superintendent of the Cordoba Railway, and

B.A.G.S. and B.A.W. Railways jointly, under the scheme of co-ordination of services and management then introduced.

Mr. C. A. Roberts, who, as announced in our issue of January 3, is retiring this month from the position of Technical General Manager, Buenos Ayres Great Southern and Buenos Ayres Western Railways, was born in Australia in 1880, educated at Victoria College, Jersey, and later at Glasgow Technical College and the Ballarat School of Mines. He served an apprenticeship with the Fairfield Shipbuilding & Engineering Co. Ltd., Govan, and in 1900 returned to Australia, where for three years he was employed with the Phoenix Foundry at Ballarat on the construction of locomotives for the

ferred to the Locomotive Running Department, to become, two years later, chief at Mecha, the most important running section of the railway. In 1914, Mr. Roberts proceeded to England to join the Army, and served with the R.F.A. in France, Belgium and Egypt, and was wounded. He was later transferred to the Ministry of Munitions, and at the end of the war occupied the position of First Assistant Superintendent of the Royal Gun and Carriage Factories, Woolwich. On his return to the B.A.W.R. in 1919, he was employed chiefly on labour questions, and represented that company on the Rules and Regulations Board. In 1922 he was appointed to take charge of the new Sub-Department of Transport, in 1926 became Sub-Traffic Superintendent, and in the following year was appointed

Traffic and Transport Manager. On July 1, 1930, Mr. Roberts was appointed General Manager of the B.A. Western Railway, and in May last he became Technical General Manager, B.A.G.S. and B.A.W. Railways jointly, under the co-ordination scheme then inaugurated.

Mr. A. White, O.B.E., who, as recorded in our issue of February 28, is retiring from the position of Divisional Superintendent, London (East) Division, Southern Railway, entered the service of the London, Brighton & South Coast Railway, at Streatham



Mr. A. White, O.B.E.,

Divisional Superintendent, London (East) Division, Southern Railway, 1930-36

Hill station, in 1888. In the following year he was transferred to Streatham Common, but in 1890 went to the trains section of the office of the Superintendent of the Line. During the next 12 years he obtained experience in several sections, and in 1902 took over the Fare Claims Department with matters affecting ticket availability. In 1907 Mr. White returned to the operating side as clerk in charge of timetables, rolling-stock and goods working. In 1911 he was placed in charge of the whole of the operating sections, including the preparation of electrification schemes, and later, for a period, matters relating to rules and regulations and signalling. In 1918 Mr. White was appointed Assistant to the Superintendent of the Line and in 1923, on the formation of the Southern Railway, became Assistant Operating Superintendent, London (East). In 1925 Mr. White was appointed Eastern Divisional Operating Superintendent and in March, 1930, was promoted to be London (East) Divisional Superintendent, from which post he now retires.

Sir Samuel Kelly, C.B.E., D.L., and Lt.-Col. A. R. G. Gordon, D.S.O., D.L., M.P., retiring Directors, were re-

elected at the ordinary general meeting of the Belfast & County Down Railway Company on February 27.

Mr. Frederick Clements, Director and General Manager of the Park Gate Iron & Steel Co. Ltd., has been awarded the Bessemer Gold Medal of the Iron and Steel Institute this year.

Mr. George Cardwell, a Director of Thomas Tilling Limited and of Tilling & British Automobile Traction Limited, has been appointed Chairman of the Thames Valley Traction Co. Ltd. (an associate of the G.W.R. and S.R.) in succession to Mr. Sidney Garcke, who has resigned his seat on the board of that company.

Mr. Stanley Kennedy, a Director of Thomas Tilling Limited and of Tilling & British Automobile Traction Limited, has been appointed Chairman of the East Midland Motor Services Limited (an associate of the L.N.E.R. and L.M.S.R.) in succession to Mr. R. J. Howley, who has resigned his seat on the board of that company.

ARGENTINE RAILWAY APPOINTMENTS

Major Oscar Lowenthal, General Manager of the Entre Rios and Argentine North Eastern Railways, has been appointed General Manager of the Buenos Ayres Great Southern and Western Railways, with effect from early next month. Major Lowenthal was formerly General Manager of the Transandine Railways and is now a member of the Local Board of the Argentine Transandine Railway.

Mr. John Wilson, O.B.E., M.I.E.E., M.Inst.T., has been appointed to succeed Major Lowenthal as General Manager of the Entre Rios and Argentine North Eastern Railways. Since June, 1933, he has been Traffic Manager of the B.A.G.S. and B.A.W. Railways, and was previously Chief Electrical Engineer and then Traffic Manager of the B.A.W.R.

INDIAN RAILWAY STAFF CHANGES

Mr. E. Ingoldby has been confirmed as Director of Mechanical Engineering, Railway Board, as from January 20.

Mr. H. M. Walker has been appointed to officiate as Divisional Superintendent, N.W.R., as from January 5.

Mr. A. B. Turner has been appointed to officiate as Deputy Chief Mechanical Engineer (Running, Carriage & Wagon), E.I.R., as from January 24.

Mr. D. Cardew, V.D., Chief Mechanical Engineer, N.W.R., has been granted ten months' leave preparatory to retirement, as from March 26.

Mr. H. W. Robinson, Deputy Chief Engineer Bridges, N.W.R., has been granted eight months' leave as from March 5 and Mr. S. M. Johnson, M.C., has been appointed to officiate in his place.

Mr. L. E. Vining, Deputy Chief Operating Superintendent (Movement) provisional, E.I.R., is confirmed in this appointment as from January 17.

Mr. M. Robertson, Deputy Agent, E.I.R., has been granted nine months' leave as from March 7.

Messrs. S. A. Jackson and G. R. Bolsover have been elected Directors of Samuel Fox & Co. Ltd., Stocksbridge, one of the companies associated with the United Steel Companies Limited.

Mr. A. S. Hampton, M.I.E.E., M.Inst.T., M.I.R.S.E., has recently retired from the position of Divisional Signal and Electrical Engineer, Scotland, L.M.S.R. Mr. Hampton is a native of Brechin, Forfarshire. A



Photo by]

Lafayette]

Mr. A. S. Hampton,

Divisional Signal and Electrical Engineer, Scotland, L.M.S.R., 1929-36

student of the Royal Technical College, Glasgow, after serving his apprenticeship in electrical engineering with the Woodside Electrical Engineering Company, he joined the Telegraph Department of the Caledonian Railway as Draughtsman. He became Chief Assistant to the Telegraph Engineer in 1910, and was appointed Telegraph and Electrical Engineer in 1920. As a result of the amalgamation, Mr. Hampton was appointed Divisional Electrical Engineer, Scotland, L.M.S.R., and in 1929 he became Divisional Signal and Electrical Engineer, Scotland, the position from which he now retires. He was Chairman of the Scottish Centre of the Institution of Electrical Engineers in 1922, and is a Member of the Institute of Transport and of the Institution of Railway Signal Engineers.

Mr. H. A. Reincke has resigned the chairmanship of William Beardmore & Co. Ltd. in favour of Sir James Lithgow, Bt., M.C., T.D., D.L., J.P. He will, however, remain as Chairman of the Voting Control Committee and as resident Director of the company in London. Sir James Lithgow, whose election as Chairman follows his acquisition of the bulk of the first debenture

stock outstanding, is a well-known Clyde shipbuilder, and an Hon. Col. in the Territorial Force. He was born in 1883 and created a baronet in 1925.

Mr. Percy Cox, Assistant Oriental Manager, Canadian Pacific Steamships, a well-known figure in the Far East, left Shanghai on retirement on February 5.

The Secretary of State for the Colonies has appointed Mr. A. Dalton, Traffic Superintendent, Tanganyika Railways, to be Assistant Superintendent of the Line, Kenya & Uganda Railways & Harbours.

SOUTH AFRICAN STAFF CHANGES

Mr. R. G. Forbes, System Manager, Kimberley, has been transferred to the position of System Manager, Pretoria.

Mr. E. X. Brain, Inspecting Engineer, Johannesburg, has been appointed System Manager at Kimberley.

Dr. Fritz Hess has been appointed by the Administrative Board of the Swiss Federal Railways to be General Secretary, in place of Dr. Cottier, who becomes Manager of the Third Division at Zurich. Dr. Hess, who is 41 years of age, has been Assistant to the General Secretary since February, 1934.

Mr. I. F. L. Elliot has been appointed Commercial Director of the British Iron & Steel Federation, and has therefore announced his resignation from the boards of Guest Keen & Nettlefolds Limited, Guest Keen Baldwins Iron & Steel Co. Ltd. and various colliery and other companies associated with the former concern.

Mr. David Crombie, Chief of Transportation, Canadian National Railways, has retired. Mr. Crombie was born in Ontario and began his career as a telegraph clerk, rising through the various grades until he became Chief of Transportation in 1923. He was the leader of the C.N.R. delegation to Great Britain last autumn, to investigate British railway methods, and so is known to many railwaymen in this country.

L.M.S.R. STAFF CHANGES

The following appointments have been approved by the directors:—

Chief Commercial and Chief Operating Managers' Departments

T. W. Dewsbury, Stationmaster, Barrow, to be Stationmaster and Goods Agent, Heysham.

W. Payne, Stationmaster, Uttoxeter, to be Stationmaster, Barrow.

H. W. Smith, Goods Agent, Rotherham, to be Stationmaster and Goods Agent, Holyhead.

C. F. H. Goldingham, Goods Agent, Loughborough, to be Joint Goods Agent, Loughborough, L.M.S.R. and L.N.E.R.

Railway Office Work at Stations and Headquarters

Mr. F. R. Potter, Principal Assistant to the Superintendent of the Line, presided at the meeting of the G.W.R. (London) Lecture and Debating Society at Paddington on March 5, when members of the society, jointly with members of the Birmingham Branch Society, discussed the motion: "That railway clerical work performed at stations is of more value than that at district and head offices." The speakers for the Birmingham Society were Mr. G. C. Jones and Mr. J. Marshall, and for the London Society Mr. B. Y. Williams and Mr. R. H. Whittington.

The points advanced were that at stations contacts were made with the railway company's customers, and that this fact added value to their work. In addition, the duties were primary and constructive, and accuracy was all-important. Such duties as the check-

ing and charging of consignment notes, invoicing, and the issue of passenger tickets were of first class importance.

On the other side it was argued that work in the district and head offices was directive and supervisory, and for that reason more valuable than the routine work done under direction at stations. The essential work at head and district offices of giving uniformity to business transacted at stations in matters of rates, regulations, and service was also stressed. It was pointed out that much clerical work at head and district offices in certain departments had no counterpart at stations and could not be compared. No vote was taken, the chairman remarking that he was sure he had the meeting with him in saying that all work well and conscientiously done was of value to the railway company.

Unification of Railways—A Debate

Under the auspices of the Federation of Railway Lecture and Debating Societies (North Eastern area), a joint debate with the G.W.R. Lecture and Debating Society was held at York on March 3. The subject under discussion was "That the unification of the four main line group railways into one system is in the national interest," the affirmative side being taken by the London & North Eastern representatives and the negative by the visitors.

Mr. Thomas Hornsby (Divisional General Manager, L.N.E.R.) presided over a well-attended meeting, and introduced the following speakers: for the London & North Eastern Federation, Messrs. T. F. Cameron, W. G. Nicholson and F. G. Wright; for the Great Western Railway society, Messrs. S. B. Taylor, H. G. Bowles, and R. F. Thurtle.

Arguments advanced in favour of the motion suggested that the great amount of co-operative working taking place between the four groups could be better achieved through one company; that under one company there would be internal advantages in the direction of various economies, and increased efficiency through the complete common user of rolling stock and other comparable developments; that there would be marked advantages from the point of view of national and public relationships and increased power of negotiation; and that it would be easier to deal with the larger industries, which were now to a very considerable extent organised on a national scale.

On the negative side some of the submissions were that by means of pooling and closer working arrangements the advantages of unification had been obtained, while at the same time the stimulus of healthy rivalry between the four groups persisted;

that, in practice, there would be no large economies under a unified system, either from standardisation, large scale operation, or otherwise; that the Railway Clearing House and Railway Companies' Association were excellent media for decisions on four-group policy; that local and district problems, which abound despite the tendency of units of industry to merge, were much more satisfactorily dealt with by the individual group companies than they could be by a unified system.

A feature of the debate was the excellent spirit in which it was conducted, with a lively exchange of playful thrusts on either side. The chairman put the issue to the vote and with a large showing on either side declared the result a draw, to the general satisfaction of the meeting.

RATING OF PROPERTIES IN RAILWAY STATIONS.—The House of Lords last Friday (March 6) reserved judgment in appeals by the City of Westminster and the Kent County Valuation Committee against a decision by the Railway and Canal Commission on April 15, 1935, as to the rating of certain station properties on the Southern Railway. The Commissioners had decided that "let out" properties, such as bookstalls, banks, and shops, inside the gates of Victoria station, and premises in a goods yard (closed by gates) at Beckenham Junction used by traders for the storage of goods conveyed or to be conveyed by railway, were not capable of separate assessment in the hands of the tenants, and that they therefore fell to be included in the railway hereditaments in the valuation roll. The hearing before the House of Lords occupied eight days in all.

LONDON & NORTH EASTERN RAILWAY COMPANY

*Satisfactory passenger traffic—Improvements in running times—
Combating road competition—C.O.D. scheme extended—Claim
for restoration of wage deduction—Rating relief question*

The thirteenth ordinary general meeting of the London & North Eastern Railway Company was held in the Wharncliffe Rooms, Hotel Great Central, Marylebone, N.W.1, on Friday, March 6, Mr. William Whitelaw (Chairman of the company) presiding.

The Secretary (Mr. James McLaren) read the notice convening the meeting.

The Chairman: My lords, ladies and gentlemen, I know that I shall be in agreement with all present here today in making a short reference not only to the great loss which our Empire has suffered through the death of our beloved King George V but also to the personal loss sustained by this company in the passing of his late Majesty. It is no secret that he loved his Norfolk home at Sandringham between which place and London it was our privilege to convey him on many occasions. His keen interest in the railway and all its employees will be very much missed by all those who had the honour of making the necessary arrangements for his journeys. As I think you all know this company provided rolling stock for the last sad journey from Wolferton to Windsor, and it remains only for me to add that we have received a letter of thanks for what we were able to do on that occasion as a last tribute to a beloved Monarch.

You have received a copy of the "Review" of the company's business for last year. I propose now only to supplement the information contained in the "Review" and to confine my remarks on the accounts to features of special interest. The net capital expenditure for the year amounted to only £220,400, largely due to credits for sales of land, the disposal of two of our older steamships and the sale of our holding of preference shares in the Scottish Motor Traction Company, the Northern General Transport Company, and the Eastern National Omnibus Company; these shares did not carry any voting rights and we were able to obtain a satisfactory price for them.

Of our total capital expenditure £16,363 were spent on works under the Development Act, 1929, and £117,706 on Passenger Duty works. In respect of the former we received during the year £98,530 in payment of annual grants. Our estimate of further capital expenditure for the year 1936 is £644,000, but additional expenditure will be incurred in the event of our Bill relating to the proposed Government Assistance Works being passed into law.

Traffics of the Year

The most satisfactory part of our year's work has been the development of our passenger traffic, which increased by nearly eight million passenger journeys, exclusive of season tickets, and yielded an increase of £332,000; that receipts from first class fares showed an increase of £49,000 is especially notable.

The merchandise and live stock traffic has been disappointing, and that we have obtained only the small increase of £29,000 is mainly due to the intense competition of the road, about which I shall have something to say later.

The sugar beet industry, so important to the agricultural interests of East Anglia in particular, seems to be now definitely organised and we can count on its continuance for a number of years, although not on the same scale as during its earlier years. The recent season was abnormally short on account of weather conditions and there was a reduction in the subsidy payable; we had also to face more intense competition by road and water. The tonnage of beet conveyed to the factories on our system decreased by 280,000 tons, or 20 per cent., and the tonnage of other traffics carried to and from the factories decreased by 180,000 tons, or 17 per cent.

In the principal classes of merchandise and mineral (other than coal and coke) traffic originating on the company's system and carried by goods train iron and steel traffic of all kinds increased by nearly 250,000 tons, bricks and cement by 26,000 tons and round timber by 65,000 tons. The chief decreases were in road material, grain and vegetables, which were less by 183,000, 131,000 and 91,000 tons respectively.

Steamship Earnings

Our steamship account shows a marked improvement over the previous year, the adverse balance having been reduced by over £50,000; to this result nearly £34,000 were contributed by passengers and £18,000 by merchandise. The S.S. "Vienna," now one of the most famous short cruising vessels, had another very successful season; we are making some alterations upon this ship, in order to render it more comfortable for our patrons on any occasion when rain may interfere with their full enjoyment of the week-end cruises which have proved so popular.

In consequence of the introduction by the General Post Office of reduced parcel post rates on July 1 it was decided to make reductions in the railway owners' risk rates for parcels up to 15 pounds weight, so as to maintain the relativity between the railway rates and the new parcel post rates. The revised railway rates were also put into operation on July 1.

Accelerations

We shall during the coming summer make further efforts to attract passenger traffic, and shall be able to make some substantial improvements in the running times of a number of our trains, and among others we have in view certain accelerations in some of our East Anglian services, and especially in that between Liverpool Street, King's Lynn, and Hunstanton. These proposed improvements are the outcome of the policy we have been constantly following in the strengthening of our permanent way and bridges, widening lines and increasing the power of our locomotives. We hope that every year will see further advances, but the completion of works contemplated under the proposed Government Assistance Schemes will be necessary before we can accomplish all that is desirable in certain districts where restricted facilities prevent the immediate development of our plans.

We are particularly anxious to improve certain cross-country services, and one of our Government Assistance Schemes under which the single line between Ely and the Newmarket-Bury line will be doubled, will provide us with a double line throughout from the north and west to Ipswich and Parkeston Quay.

A scheme was introduced on January 1, 1936, by which the public are enabled to "Save to travel." The scheme applies to all descriptions of rail tickets other than season tickets, and stamps of a value of 1s. and vouchers of a value of 10s. are on sale at all L.N.E.R. stations and offices. Purchasers of the stamps are supplied with a card on which to affix the stamps, each card holding ten stamps, completed cards being exchanged at any booking office for a voucher of the value of 10s. Each 10s. voucher will bear interest at the rate of 5 per cent. per annum for each calendar month (namely $\frac{1}{4}$ d. per voucher per month subject to a maximum of twelve months).

Road Competition

Reference has already been made to the intense road competition which has had to be faced, and to its adverse effect on our merchandise and live stock traffic. The measures adopted to combat this competition have been developed and extended. Our cartage equipment has been

enlarged and the policy of mechanisation has been continued. Additional vehicles have been acquired to augment our country lorry services and provide collection and delivery facilities at an increased number of stations and over wider areas. Improved service for traders has also been given by a reduction in transit time, largely as a result of an extension of the policy of providing braked train services wherever practicable. In the course of 1935 the booked braked train mileage was increased by 18 per cent.

Container Traffic

Traffic carried in containers has greatly increased, and our stock of containers has grown from 450 in 1928 to over 2,000, including those of special construction for the conveyance of dry ice, meat, furniture and cycles. An indication of the popularity of the container may be gained from the fact that during 1935 the company's containers were loaded on the company's system or back loaded by other companies over 70,000 times.

The scheme for the Registered Transit of merchandise by goods train ("Green Arrow" Service), which was brought into operation on June 1, 1933, increased in popularity during the year, and the number of consignments originating on the L.N.E.R. during 1935 was more than 50 per cent. greater than in 1934.

Blue Arrow Service

In view of the success of the "Green Arrow" Service it was decided to institute a similar service for traffic by passenger train as from January 1, 1936. This service is known as the "Blue Arrow" service, and operates in a similar manner to the freight train service, the sender, for the payment of an additional fee of 2s. 6d. per consignment, being advised of the approximate time of arrival at destination, and the traffic being kept under observation throughout its journey in order that the quoted transit time may be maintained.

The "Cash on Delivery" scheme, which was introduced by the railway companies on July 1, 1934, has met with considerable success, and the number of consignments forwarded under this scheme shows a progressive increase. In view of the success of the scheme it was decided that as from January 1, 1936, the limit of value should be increased from £40 to £100, the commission fees for the higher values varying from 2s. 6d. for amounts between £40 and £50 up to 5s. for amounts between £90 and £100.

In addition to affording improved facilities such as I have described we follow a policy of granting exceptional rates with the object of retaining traffic in the face of road competition in all cases in which net revenue would thereby be improved. We have also continued to avail ourselves of the power to make agreed charges with traders. In our efforts to meet road competition we are, however, still handicapped by the privileged legislative conditions under which our competitors operate. The legislation passed in recent years has gone some way towards establishing equitable conditions of competition, but there is still a great deal to be done before complete equity is established.

Coal Prices

In the month of January we were, in common with the other companies, approached by the representatives of the coal trade with a request that we should agree to a voluntary increase of 1s. per ton in the price of coal under our existing contracts, in order to assist in the granting of an increase in wages to the miners. This request we felt bound to decline since the increase must have constituted a direct reduction from the dividend fund, already far too low, but it is unfortunately true that we shall be able to make new contracts only on the basis of an additional shilling per ton, which in a full year will increase our coal bill by about £230,000.

In March, 1931, following the serious fall in the company's revenue, percentage deductions from the earnings of all grades of the company's staff were introduced. From the same date the National Wages Board decided that the payments for night duty, overtime, and Sunday duty worked by staff in conciliation grades should be on a lower basis.

The percentage deductions from earnings in the case of conciliation grades were 2½ per cent. on all earnings with a further 2½ per cent. on earnings in excess of 40s. per week, subject to certain minima. Comparable deductions were applied in the case of other grades.

After prolonged negotiations in 1934, the railway companies and the trade unions agreed to partial discontinuance of these deductions with the result that our wages costs during 1935 have been increased by £320,000. Your directors did not approve of that agreement, which in their view was not justified by the increase of traffic then realised or in prospect and events have, I think, shown that this view was well-founded.

Wages Claim

In September, 1935, the trade unions submitted to the companies applications for the discontinuance of the rest of the percentage deductions and the restoration of the bases of payment for night duty, overtime and Sunday duty which were in operation prior to March, 1931. It is evident that this company is in no position to face such an increased charge as would be involved in any general increase of wages, and if the claim is pressed your directors are of opinion that it should be referred to the National Wages Tribunal.

You will wish me to say a few words with regard to the valuation of the company's undertaking under the Railways (Valuation for Rating) Act, 1930, for assessment to local rates. The present position is this: The Railway Assessment Authority who under the Act are charged with the duty of finding in the first instance the valuation of the company's undertaking as a whole in England and Wales have fixed that valuation at nil. From that decision there is a right of appeal to the Court of the Railway and Canal Commission whose function is to re-hear the whole matter, there being no right of appeal from that court except on questions of law.

Certain local authorities are appealing to the Court of the Railway and Canal Commission from the decision of the Railway Assessment Authority to which I have alluded and that appeal is now pending.

Valuation for Rating

As you are aware the recent decision of the House of Lords in the Southern Railway Company's case has established certain principles to be applied under the Act to the valuation of railway undertakings for assessment to local rates. Although we are confident that the application of those principles to the facts of the company's case must result in the company becoming entitled not only to considerable relief in respect of present obligations for rates but also to substantial repayments in respect of past over-payments, your directors, seeing that the whole matter will shortly be before the court, do not think it prudent to anticipate the court's decision by attempting to make (for the purposes of the accounts of the year 1935) an estimate of the relief which it is hoped will follow from that decision. In these circumstances your directors have decided not to take credit in the accounts of 1935 in respect of the relief which it is anticipated will follow when the valuation of the company's undertaking as a whole in England and Wales is finally determined.

Operating Statistics

The average freight train load on the L.N.E.R. during 1935 was 130½ tons as compared with 131½ tons in 1934. The decrease is attributable in the main to the falling off in coal traffic which provides a very heavy train load. The average train miles per train hour for freight trains during 1935 was 9.34, an increase of 1½ per cent. over the previous year. This improvement, which is a continuation of the trend over a number of years, is partly a result of the increase in the number of express brake-fitted freight trains to which reference has already been made. The figure of net ton miles per total freight engine hour for the L.N.E.R. for the year 1935 was 506½ as compared with 505½ in 1934. The increase has been brought about by the higher average speed of the trains and in spite of the falling off in the average train load. This statistic is usually considered to be one of the most important indices of operating efficiency

on the freight side, and it is gratifying to see that the high level which it has reached is still rising.

The average train miles per train hour for passenger trains during 1935 was 14.36, an increase of 1 per cent. over the previous year. This figure has shown a consistent increase over a number of years and is a reflection of the widespread improvements which have been made in the speed of our passenger trains.

The ratio of railway working expenditure to gross receipts has been 82.3 as compared with 82.2 in the previous year. Joint lines have yielded £25,900 more, interest and dividends in other undertakings are £18,000 higher, and Treasury grants under the Development Act have been £98,530, or £2,442 above the amount for 1934.

We continue to take £50,000 from general reserve to meet the sinking fund charge on the 4½ per cent. debenture stock, which is not under present circumstances chargeable to revenue. The balance available enables us to recommend the payment of the same dividend as last year and carry forward £40,182 as against £43,033.

I now move: That the report of the directors with relative statement of accounts for the year ended December 31, 1935, be received and adopted.

Sir Murrough-Wilson: I beg to second that.

Shareholders' Remarks

Mr. A. J. Barber-Fleming, speaking on behalf of the British Railway Stockholders' Union, expressed disappointment that the directors had not, like those of the other companies, taken credit in the accounts for the anticipated saving in rates and in payments to the rebates fund. He thought a credit might have been taken in the accounts for £600,000 which would have enabled the dividend on the first preference stock to be paid in full. This was the only company which was not paying in full the dividends on its preference stocks. He did not wish to go into the merits of the men's claim for restoration of the balance of the cut in wages but he would like to point out that the deficiency in standard revenue, which was practically the dividend of the constituent companies in 1913, had been £32,000,000 since 1930, or about £6,000,000 a year, whereas in pre-war money the men's wages were double what they were in 1913. He gratefully acknowledged the invariable courtesy with which the communications from the Stockholders' Union had been received and answered by the company.

Mr. W. Clancy addressed the meeting at some length until the Chairman, at the request of the majority of stockholders present, ruled that he must confine his remarks to the report and accounts then before the meeting.

Councillor John Wilson expressed satisfaction that the C.O.D. scheme, which he had urged two years ago, had now been extended up to £100 in value. This was one of the greatest assets the manufacturers had got; it protected them from bad debts and long-firm frauds, and the goods remained the property of the consignor until paid for. He advocated a 1d. a mile single fare. He wished the public to understand that the Government derating scheme of 1929 was not intended to benefit the railways but was really a subsidy to the heavy industries. The Railway Rates Tribunal was inaugurated at a period when railways were a monopoly for the purpose of seeing that they did not get too much dividend. Today they were a very competitive business and were not getting any dividend at all. The ordinary householder did not understand that the greatly increased rates he had now to pay on highways and bridges were another subsidy to the competitive road interests. The railway rates on heavy industrial traffics should be fixed so as to pay 2½ per cent. to the ordinary stockholders.

Mr. J. W. Rattray wished to know if the expense incurred in organising the "Silver Jubilee" train were justified. He thought that there should be better supervision of the treatment of the upholstery in the carriages, to prevent people putting their feet on the seats. He also objected to the excessive use made by young people of the bar in the "Flying Scotsman."

Miss Sievwright also referred to the damage regularly

done on Sundays to the windows and cushions of the carriages, and said that her frequent complaints on the subject were not attended to.

Mr. J. H. Loader asked whether the interest on the debenture stock which it was contemplated to issue to the Railway Finance Corporation as security for the proposed loan would be in priority to the existing stocks.

Mr. Franey asked for an indication as to when the contemplated improvement of the services on the Cambridge, Lowestoft and Yarmouth lines would be carried out. The distance between London and Cambridge was approximately the same as that between London and Brighton.

Mr. W. E. Sutcliffe requested an assurance that the competitive rivalry between this company and the London Midland & Scottish had ceased. He urged that everyone of the 500,000 shareholders in this company should do their duty and support their property.

Miss Sievwright suggested that it was not the time to embark upon redecorating waiting rooms in provincial railway stations on the scale on which it was being done now, and particularly instanced the case of West Hartlepool.

Mr. Butcher, referring to the expenditure contemplated under the two agreements with the Treasury, asked whether the board had formed any estimate of the contemplated revenue up to 1940 from that expenditure, and whether it would be sufficient to meet the interest on the loans and the dividend charges on the existing stocks.

Mr. Howe brought up the question of granting privilege tickets to stockholders to attend the annual meeting.

Chairman's Reply

The Chairman: Well, ladies and gentlemen, I will try to answer some of the questions that have been put. With reference to what Mr. Barber-Fleming said, our position is somewhat different from that of any other company. The Southern Railway case has been practically concluded; I believe there is some small question still outstanding. The cases of the Great Western and London Midland & Scottish Railway Companies have not even yet been settled by the Assessment Authority. It may be, for all I know, that they know that they are going to get some agreed settlement, and that their case will never come before the Railway and Canal Commission Court. Our position is quite different. The decision of the Assessment Authority is actually under appeal to that court, and it would be most foolish for us, I think, to speculate upon what the decision of a Court of law is going to be.

As to dividends, no one is more anxious to pay higher dividends than I and my colleagues are, but dividends can only be paid out of earnings. The matter of a penny-a-mile single fare has been discussed at the Clearing House by the managers, and has been rejected. If we attempted to raise our freight rates to anything like the extent suggested by Councillor Wilson, we simply should not get the traffic.

I was asked about the Silver Jubilee train. I really have explained that in "The Review." I think sometimes if shareholders would really read "The Review," which is sent to them to give information before the meeting, so that they may frame their questions in view of the information they have got, a good many of these points would hardly need to be raised. We required a new train because the traffic between Newcastle and London was too heavy for our existing service. We did not require another whole train of the same length as the old trains, and we took this opportunity to put on a train of moderate length, which could be run at a high speed. It is exceedingly popular. Seats have generally to be booked at least a day beforehand, and it is running extremely well, most punctually, and with good economy. We have tested what I may call the Silver Jubilee engines on other heavy trains, and we find that they are able to effect a very good economy in coal consumption as compared with other engines. For that reason, as stated in "The Review," we are going to streamline all the Pacific locomotives at present under construction.

In answer to Mr. Rattray's question, I quite agree that it is a most reprehensible practice for passengers to put their feet on the cushions of carriages, but anyone who attempts to interfere with it gets a great deal of abuse.

I think the refreshment bar in the Flying Scotsman is satisfactory; it seems to be an attraction, and I am not proposing either to extend it or to do away with it.

There seems to be a misunderstanding about the 4 per cent. debenture stock. For these Government loans we may some day be called upon to issue 4 per cent. debenture stock, power for which we are getting in our Bill before Parliament, as collateral security. It will, very likely, never be asked for at all. If it is asked for, it will have to be created and issued as collateral security to the lending authority and in that case it will have the same priority as our existing debenture stock.

This is the first time that I have ever heard anyone suggest that we are spending too much on our waiting rooms; it is generally exactly the opposite way round. I shall ask my colleague from West Hartlepool to examine carefully the waiting room there and see if any kind of extravagance has been incurred. We are not spending £50,000 there.

The gentleman who asked about the Cambridge service appears to have overlooked the fact that we have an admirable express service from King's Cross to Cambridge, and I do not think anyone could ask for or expect anything better. The Yarmouth service may not be as fast as people would like, but we may be able (I do not know that we shall) one day to improve that service, when we have got some of the works carried out on that East Anglian line, which we have in contemplation under the Government scheme. We have got a pooling scheme with the London Midland & Scottish Railway which is being worked by both companies with perfect fairness towards each other, though I admit I would have liked a simpler and more complete scheme. Where the traffic is competitive it is pooled.

The Government assistance works which we propose to carry out, if our Bill is passed, will be essential to this company five or six years hence. For that very reason we would not have burdened the capital or revenue of the company today, if it had not been that we were given this opportunity to get money at a much cheaper rate than we could anticipate getting it even five years hence—2½ per cent. I do not say that every one of these schemes will bring in large returns; some of them will bring in quite a good return; but taking them all over I feel quite certain that after all the consideration we have given to them (again referred to in "The Review") we should have been extremely foolish if we had not accepted the offer made to us.

The privilege tickets question has already been voted on here, and we have decided that we cannot issue free tickets for these meetings.

The resolution for the adoption of the report and accounts was then put to the meeting and carried unanimously.

The Chairman moved and Sir Murrough J. Wilson seconded: "That dividends be now declared in terms of Account No. 9 headed 'Proposed Appropriation of Net Revenue'; that the dividends be payable (under deduction of income tax), less: (1) the amounts paid as interim dividends appearing in Account No. 9 (a) headed 'Statement of Interim Dividends Paid'; and (2) the balance paid on February 15 last of the dividends on the first and second guaranteed stocks—by warrants on March 12 to the proprietors registered in the books of the company at the close of business on January 31, 1936, and that warrants be sent by post on March 11."

On being put to the meeting the motion was carried unanimously.

The following were then re-elected Directors of the company:—Sir Murrough J. Wilson, K.B.E., The Hon. Rupert E. Beckett, The Rt. Hon. Lord Burghley, M.P., Mr. A. R. Gray, Lt. Col. the Hon. A. C. Murray, C.M.G., D.S.O., Sir John H. B. Noble, Bart., Mr. Clarence D. Smith, Mr. W. K. Whigham.

On the motion of the Chairman, seconded by Sir Murrough J. Wilson, Sir Charles MacAndrew, M.P., was appointed a member of the Audit Committee in place of the late Dr. Thomas Cowan, LL.D.

Sir W. Harry Peat, K.B.E., F.C.A., was re-elected an Auditor of the company.

SPECIAL GENERAL MEETING

A special general meeting of the London & North Eastern Railway Company was held at the Wharnccliffe Rooms, Hotel Great Central, N.W.1, on Friday, March 6, Mr. William Whitelaw (Chairman of the company) presiding. The Secretary (Mr. James McLaren) read the notice convening the meeting.

The Chairman: The company are promoting this Session two Bills in Parliament and a Provisional Order in Scotland, which under the Standing Orders of Parliament have to be approved by the shareholders at this special meeting. These Bills and the Scottish Order are required in order to give effect to the schemes of works which, as explained in the annual report of the directors and the review of the company's business circulated therewith, the company are to carry out with the assistance of the Government pursuant to certain agreements with the Treasury and also in order to give effect to the financial arrangements contained in those agreements. As the financial arrangements both in the London Transport Bill and in the General Powers Bill are similar, it may be well to refer to these at the outset and to explain later the principal works and powers contained in the two Bills.

In the case of the London Transport Bill a Finance Corporation has been constituted in pursuance of the agreement with the Government, and that corporation has raised the sum of £32,000,000 under Government guarantee as indicated in the "Review." The provisions of the Bill enable the company to borrow their proportion of this money from the Finance Corporation and provide for the creation of such an amount of 4 per cent. debenture stock, not exceeding in the aggregate £10,000,000, as at the nominal or par value thereof shall be equivalent to the amount to be borrowed from the Finance Corporation. The stock so created is to be held as collateral security for the loan by the Finance Corporation to the company but is not to be issued during the period for which the loan runs otherwise than to the Finance Corporation and then only with the Treasury consent.

When the loan has been repaid or for the purposes of repaying the loan, the company will have power at the expiration of the loan period to create and issue stock of any denomination up to the nominal amount of the debenture stock created for the purpose of collateral security, which debenture stock will at the expiration of the loan period be cancelled. Under the arrangements with the Government, the company are not to be required to pay loan capital or other duties on the debenture stock created as collateral security. This means a substantial saving to the company because, without such provision, they might have been chargeable in respect of this debenture stock, and the charge of it as collateral security, to duties and stamps amounting to some £15,000, and the Treasury concur in the provisions contained in Clause 32 of the Bill relieving the company from this liability. The financial provisions in the General Powers Bill are on exactly similar lines except that the maximum amount of debenture stock to be created under that Bill is £6,000,000.

As regards the general objects of the two Bills, those of the London Transport Bill comprise (Clause 6) widenings of the company's railway near Liverpool Street station and at Stratford, the acquisition of lands (Clause 12) at various points on the suburban portions of the company's system for the purpose of providing additional station accommodation, transformer stations and other improvements; (Clause 26) to close certain level crossings and (Clause 28) to revive powers which have now expired for the construction of two tube railways at Finsbury Park to connect the Great Northern and City Railway with the company's Edgware and Highgate branches to the north of Finsbury Park station. The remainder of the provisions of the Bill are those usual in the case of all Bills which the company promotes and do not call for any special explanation.

The company's General Powers Bill comprises the powers necessary to effect the widening of the Ely and Newmarket Railway, the Felixstowe Branch Railway and the line to Clacton, and to construct running loops at different points on the main line between Grantham and Retford with the

object of facilitating traffic working. It also authorises works of diversion of roads in connection with the electrification of the line between Manchester and Sheffield, and in connection with the improvements at York station the extension of the bridge under the railway at the northern end of the station. In connection with the various schemes to which, under the agreement with the Government, the company are to give effect, it will be necessary to purchase small areas of land at many different places on the system and this is provided for by Clause 13 of the Bill. Clause 32 of the Bill provides for the closing of the Grantham Canal which has for some time past ceased to be used as a navigation and makes provision for arrangements with regard to the canal between the company and the drainage authorities through whose areas the canal passes.

As regards the Scottish Provisional Order, its main purpose is to stabilise and continue the company's charging powers in respect of the Edinburgh and Glasgow Union Canal. The company's powers to make the present charges on this canal are temporary and cease at the end of the present year. The effect of the provisions of Clause 12 is to bring the company's charging powers in respect of this canal into line with the powers which they have previously obtained in regard to the English canals. The Order also authorises the company to acquire at various places the lands necessary to give effect to the arrangement with the Government in so far as it applies to the company's undertaking in Scotland. Other provisions are contained in the Order designed to bring the company's general powers in Scotland into line with those which have already been conferred upon the company in regard to England.

Bills are being promoted by the London Passenger Transport Board and by the Great Western Railway Company which contain provisions for carrying into effect the general scheme for improvement of the transport facilities in the area covered by the London Passenger Transport Pool. As both these Bills confer certain powers affecting the company's lines and authorise agreements and arrangements to be made by the company with the promoters of them in connection with the general scheme, it is necessary that they should receive your formal approval.

The Bills and Order were approved and the proceedings terminated.

THE L.N.E.R. IN 1935

The following is the Chairman's review of the L.N.E.R. Company's business in 1935:—

The marked improvement of trade on the company's system which developed in the year 1934 has not been fully maintained in the year under review. During the first twenty-six weeks of the year our merchandise traffic of all classes decreased by £80,000, the coal and coke traffic by £142,000. During the remainder of the year there was an increase in merchandise traffic of all classes of £108,700. The coal and coke traffic during this latter period increased by £54,000, largely due to the laying in of stocks in view of the anticipation of a dispute over wages in the coal trade. Fortunately our efforts to improve our passenger traffic were rewarded with success throughout the year, with the exception of the month of September, during which the weather was almost everywhere deplorable. The following table shows the railway traffic receipts and the increases and decreases in the years 1929, 1934 and 1935:—

	Passenger	All Merchandise and Livestock	Coal and Coke	Total
1929	19,097,000	21,853,000	14,132,000	55,082,000
1934	16,161,000	16,472,000	11,905,000	44,538,000
1935	16,466,000	16,501,000	11,817,000	44,784,000
Increase or decrease — 1935 with 1934	+ 305,000 = 1.89%	+ 29,000 = 0.18%	— 88,000 = 0.74%	+ 246,000 = 0.55%
Decrease — 1935 with 1929	— 2,631,000 = 13.78%	— 5,352,000 = 24.49%	— 2,315,000 = 16.38%	— 10,298,000 = 18.70%

The tonnage of freight traffic carried in 1935 has decreased

by 665,000 tons, or 0.54 per cent. compared with that of 1934, but the number of passenger journeys (excluding season tickets) has increased by 7,970,000, or 4.13 per cent. The freight engine miles showed an increase of 47,000 or 0.05 per cent., and the passenger engine mileage an increase of 1,570,000 or 2.04 per cent. The reduction in first class return fares which was brought into operation at the beginning of 1935 has been justified by the increase in first class travel, and the existing passenger fare arrangements, including the issue of monthly return tickets at 1½d. per mile first class and 1d. per mile third class, are being continued during 1936.

Good progress has been made with the building of the new rolling stock referred to in the review of last year, and we must consider ourselves fortunate in having placed orders for so large a programme before any general increase of prices of materials used in the construction of engines, carriages and wagons took place. We obtained most valuable information from the trials which were carried out at the testing station at Vitry, near Paris, to which our *Cock o' the North* engine was sent, and the remaining engines of this type will have incorporated in them such alterations and improvements as have been suggested by this test.

Success of Streamlined Engines and Train

The most outstanding feature of our rolling stock construction during last year has been the building of our Silver Jubilee train and engines. Our experience with the engines of this type, which have also been tested on our heaviest express trains, seems to leave no doubt that the system of streamlining is of great value when speeds of 65 m.p.h. and over are maintained for considerable distances, and it is our intention to streamline the Pacific engines which will be built under our 1936 programme. As a result of the experiments which we made in the early part of last year, referred to in the review of the company's business, we decided later in the year to institute an exceptionally fast service for passenger traffic between Newcastle and London. The demand for accommodation in our trains between Newcastle and King's Cross had outgrown the capacity of even the very heavy trains which had been provided, and the running of a new train had become imperative. We resolved therefore to make a new departure from our previous practice and to run a train with limited accommodation at a high speed and stopping only once on the way between Newcastle and London. The weight of the train itself is 220 tons, and the engine and carriages are all streamlined. A stop is made at Darlington in order to extend the use of the train to the whole of Tees-side. The journey is accomplished in four hours, and has been run with remarkable punctuality, no difficulty having been experienced in maintaining high speed on up gradients, which was one of the chief objects we had in view; the average speed of the train is just over 67 m.p.h.

The train ran for the first time on September 30, when the Lord Mayor of Newcastle travelled by it and was received by the Lord Mayor of London on arrival at King's Cross. It has proved so popular that passengers have found it advisable to reserve seats some time in advance; in view of the exceptional speed and comfort of this train, supplementary charges of five shillings for first class and three shillings for third class are made, and these charges have to be paid by everyone travelling by it. It is with no little satisfaction that we are able to announce that our Silver Jubilee train, so named in honour of and by permission of His Majesty our late King George V, and hauled by one of our streamlined locomotives *Silver Link*, *Quicksilver*, *Silver King* or *Silver Fox*, has completely justified its existence and may now be regarded as a permanent addition to our express services.

Apart from expenditure under the Passenger Duty Scheme and the Railway Development Act (1929) the expenditure schemes authorised by the directors in former years and reported on during 1935 numbered 211; their cost amounted to £396,654, and the savings in annual expenditure secured by their adoption totalled £109,707, equal to nearly 28 per cent. on the cost. The total investment of the company in the associated omnibus companies at the end of 1935 was

£2,329,728. The dividends and other sums received during the year totalled £204,152, representing a return at the rate of 8.76 per cent. as compared with 7.97 per cent. in the previous year. Some of the revenue was in respect of capital held only for part of the year and the whole represents an equated annual return of 8.93 per cent. In addition, the net savings accruing to the company from the closing of branch lines for passenger traffic and reductions of train services rendered possible by the employment of omnibus services, amounted during the year to approximately £98,500.

Road Transport Policy

Investments in companies engaged in the road transport of parcels and freight amounted at December 31, 1935, to £630,548, the bulk of which is represented by shares in Carter Paterson & Company and the Hay's Wharf Cartage Company, the whole of the capital of which was purchased in 1933 by the four railway companies in equal proportions. The railway companies have latterly extended their interests in these concerns by the provision of loans to enable the cartage companies to improve their equipment and depot accommodation, and to acquire substantial interests in other road haulage firms with whom they were in competition or with whose services useful co-ordination could be effected. During the past year the return secured from the London & North Eastern Company's investment in goods road transport was £31,543, or approximately 5 per cent. The policy of extension and mechanisation of our own cartage equipment has been continued. The total number of goods and parcels road motor vehicles operating at the close of the year was 3,033, compared with 2,791 at the end of 1934. Additional vehicles have been purchased to supplement our country services and provide collection and delivery arrangements at an increased number of stations, and over wider areas. To the trading community and to the company alike, this form of co-ordinated transport is proving to be of considerable value. The development of rail traffic requires additional cartage power, and this has been met by increasing our motor fleet. The cartage arrangements for which we were responsible in connection with the Royal Agricultural Society's Show, held at Newcastle-on-Tyne, were entirely carried out by means of mechanical equipment. During the year schemes have been approved involving the displacement of 273 horses and the substitution, with resultant economy, of 148 motor vehicles, mainly of the type known as the "mechanical horse." In consultation with the manufacturers, investigation is being made into the question of designing a lighter type of this vehicle to enable the mechanisation of railway cartage work to be carried out with advantage on an even more extensive scale.

The Heavy Industries

The iron and steel industry continued to expand during the year, steel output reaching a record high level at 9,842,400 tons. The pig iron production of 6,426,400 tons was higher than in any year since 1929, and it is encouraging that there are prospects of further expansion of output during 1936. Safeguarding has had the effect of strengthening the home market, for exports show further improvement whilst imports have been checked. Domestic consumption of steel is now exceeding the rate of consumption in 1929 and saturation point has not yet been reached. The demand for shipbuilding materials is on the increase and the other major markets for steel, viz., building, railways, and motor vehicles, may be expected to take increased quantities. Supplies of steel scrap have diminished in recent months and there is a shortage of pig iron. The present year is, therefore, likely to see a further increase in the number of blast furnaces operating on our system.

The coal trade has not made the progress expected during 1935 and production in the United Kingdom increased by only 0.91 per cent. over 1934. During the year 1935 the shipment coal traffic originating on the company's system fell off by 1,382,000 tons. The severe import regulations in France and Belgium continued to restrict the trade with those countries, and for a few months before the application of Sanctions coal shipments to Italy had practically ceased. Shipments of coal from the Tyne to Italy declined by

670,665 tons in 1935 compared with 1934. A decrease in landsale coal originating on our system of 285,000 tons at the end of September was turned into an increase of 1,025,000 tons by the end of December.

The shipbuilding industry made little improvement in 1935. Certain shipyards were more busily employed on merchant and naval work, but for the greater part of the year no more than 30 per cent. of the shipbuilding berths were occupied and there was only work for 60 per cent. of the number of men employed in 1929. The outlook for 1936 is brighter than it has been for several years and it has been estimated that, when the work is proceeding in the shipyards on the new orders obtained in the last quarter of 1935, the merchant tonnage under construction will approach the three-quarter million mark for the first time since the beginning of the depression five years ago. It is gratifying that the shipyards on the North East Coast are now sharing in this improvement. The number of vessels laid up in the Tyne at the end of 1935 was only 37, with a N.R.T. of 83,667, compared with 106 vessels and 240,259 N.R.T. two years previously.

Continental Services Active

Although our steamships accounts show a debit balance of £44,474 this is, nevertheless, £53,064 better than last year. Our Harwich Continental services reveal gratifying increases both in passengers and cargo. The number of passengers increased by roughly 13 per cent., and whilst all services did well the improvement in the case of the Antwerp service is particularly noteworthy, thanks to the combined effect of the Brussels Exhibition and the encouragement given to British holiday-makers by the devaluation of the Belga. There was a surprising increase, something like 60 per cent., in the number of motorcars accompanying passengers. Our week-end cruises, too, had their most successful season since their inception in 1932, and we are confidently looking forward to still better results during the coming summer.

The increase in cargo carried by our Harwich steamers during the year amounted to over 8,000 tons, or 5 per cent. This was all in imports; nevertheless, the total imports continue to be less than half what they were in 1931. There was a gratifying increase in traffic by our Harwich-Zeebrugge train ferry, particularly in fruit from Italy. This service is naturally beginning to feel the effect of Sanctions; the full force of these, however, is not likely to be experienced before the Spring. In order to place the several steamship services in the Humber under a single management, a new organisation known as Associated Humber Lines has been brought into being. Our Grimsby services form one of the constituent parties, and already substantial economies have accrued to us in this connection. The new diesel-electric paddle ship "Talisman" for the Clyde service was received from the builders in June last, and has proved entirely satisfactory in service.

New Works

The year 1935 saw the completion of two of the largest works undertaken by the company as a result of the remission of passenger duty. On October 28 the new down marshalling yard at Mottram, on the line between Sheffield and Manchester, was brought into use, and on December 9 the new inward goods yard at Hull was opened for traffic. These two up-to-date yards will be of material assistance in improving the working of the company's goods and coal traffic. The Hull yard is equipped with mechanical brakes of the latest design. The company has now nearly completed the expenditure of the total sum agreed to be spent in respect of the remission of the passenger duty. The camping coach continues to find favour with the public. 66 coaches were in use during the year, and it is proposed to convert and equip 40 more for use during 1936.

In the review of the company's business for 1934, reference was made to the question of the electrification of our Great Eastern suburban service, including a statement as to the consideration which the directors had given to that question from the time of amalgamation onwards. We had been forced to the conclusion that the electrification of the Great Eastern suburban lines could not be undertaken

in the absence of a pool of competing interests and of substantial Government assistance. That both these deficiencies have now been met is a matter of great satisfaction to the directors. The first has been overcome by the formation of the London Passenger Transport Board and the creation of a pool of suburban passenger traffic established between that board and the four main line companies. The second deficiency has now also been met by the offer of Government assistance. A loan of £32,000,000, guaranteed by the Government as to principal and interest, has been issued bearing interest at the rate of $2\frac{1}{2}$ per cent. repayable within a period of 15-20 years, each company interested undertaking, if called upon, to issue debenture stock as collateral security in respect of its share. £8,000,000 out of this total has been allocated for the electrification of sections of the Great Eastern and Great Northern suburban lines. It is anticipated that the work will be completed within five years.

Benefits of London Passenger Transport Pool

The details of the scheme are sufficiently well known, but it may be worth while to emphasise that they involve a very large measure of co-operation between the London & North Eastern Railway and the London Passenger Transport Board—a co-operation which would have been impossible at any time before the formation of the London Passenger Transport Pool with its abolition of separate and sectional interests. The scheme is a large one, involving very heavy specialised expenditure over a period of years. For this reason it was not possible to embark upon more comprehensive proposals. This limitation of the scheme has been a source of complaint from some sections of the suburban areas which were not included in it. The directors regret that such a feeling of disappointment should exist, but under the new conditions the decision does not rest with them. The London Passenger Transport Act of 1933 established a Standing Joint Committee, representing London Transport and the four main line companies, to decide upon all questions of this character. This committee, after the most careful consideration, selected for electrification those sections of line where the present suburban services were in their opinion most crowded and least satisfactory. The committee has also undertaken to consider the extension of electrification as soon as the developments at present in hand have made further progress.

The principle of Government assistance as applied to works undertaken by the London Passenger Transport Pool has now been extended to a programme of works to be undertaken by the main line companies. A loan of £27,000,000 guaranteed by the Government as to principal and interest has been issued bearing interest at the rate of $2\frac{1}{2}$ per cent., repayable within a period of 15-16 years, each company undertaking, if called upon, to issue debenture stock as collateral security for its share. This is to cover a programme of new works in which all the main line companies share; the proportion undertaken by the London & North Eastern Railway is about £6,000,000. The directors appointed a special committee to examine the proposals, and after the fullest consideration they resolved to accept the offer of financial assistance and to undertake a number of works estimated to cost about £6,000,000. Many of these works would be essential to the efficient conduct of the company's business six or seven years hence, and the opportunity to carry them out without delay under financial arrangements so favourable as those offered was one which the directors felt bound to accept.

Government-Aided Works

The works undertaken will be designed to improve the movement of traffic and increase the efficiency of the whole service. They will include the straightening of the main line at Colchester and the doubling of the lines into Clacton and Felixstowe and between Ely and the junction at Snailwell with the Newmarket-Bury line, the latter of which is greatly congested with important cross-country traffic. Other works comprise the remodelling of Southend station; the construction of loop lines to facilitate train running on the main line between Grantham and Doncaster,

and between Berwick and Edinburgh, and the installation of colour-light signalling over a distance of about 120 miles partly in England and partly in Scotland. Modern traffic requirements have rendered our stations at York and Doncaster unequal to the demands made upon them, and really satisfactory operation of both passenger and freight trains through them has become extremely difficult. More width and an increase in the number of platforms have become of even more importance than mere length, and our plans include provision for new platforms at both places along with remodelling of the signalling.

Provision will also be made for the addition of 162 passenger carriages to our carriage stock, and the replacement of between 40 and 50 locomotives which are of an unsatisfactory type by new engines of modern design. Considerable alteration in the frontage of King's Cross station is contemplated, but a definite decision has been postponed until we know more about the requirements of the London Passenger Transport Board in connection with a new underground station and the proposals as to the alteration of the road approaches by the Road Authority. The further adoption of safety appliances such as the extension of track circuits, the provision of automatic train control and the substitution of electricity for gas in the lighting of carriages will also form part of our programme.

The new dock at Grimsby has provided ample water space, coaling and fitting out facilities, but the accommodation for landing and marketing is inadequate. It is proposed to construct a new quay and market along the south side of No. 2 dock, to widen the south-west quay and provide marketing accommodation thereon.

Sheffield-Manchester Electrification

There remain two works of a very important nature for inclusion: the adoption of electric traction between Sheffield, Wath yard and Manchester, and the extension of St. Andrew's fish dock at Hull. This electrification proposal does not mean that the directors have changed their views upon the subject of the general electrification of railways. The line referred to is peculiarly suitable for electric traction, offering as it does a high load factor which will enable us to secure a supply of current at a low rate; the mineral trains are extremely heavy, requiring quite exceptional power, and the electrification will at the same time solve problems in respect of the working of trains through Woodhead tunnel which have given us much concern in the past. The trains will be worked by electric locomotives and the system will be that of direct current at 1,500 volts with overhead conductor.

During the last twenty years the total dock and rail receipts for Hull fish traffic have increased from £147,000 to over £639,000. The only suitable scheme for improving the present facilities which, in spite of very considerable additions during the last ten years, are felt to be inadequate for the efficient handling of the trade, is the construction of further dock accommodation at the west end of St. Andrew's dock, and proposals for this purpose are being considered in consultation with representatives of the Hull fish trade.

NEASDEN RAILWAY DEPOT REBUILDING.—Work for about 300 men will be provided for nearly two years in rebuilding the Neasden railway depot of the London Passenger Transport Board. Demolition of the old buildings has just begun. The new depot, which will be the largest operated by London Transport, will accommodate about 650 passenger vehicles. Neasden depot is nearly 60 years old and now accommodates 550 passenger vehicles, which will have to be maintained during the reconstruction stage. Modern design will allow the inspection, maintenance, cleaning and washing of rolling stock to be done progressively. Cars will move forward in stages until ultimately they pass through a machine in which the exteriors will be washed with water. Electric plant will be installed to clean the interiors.

To cater for the 450 employees, each man will have a locker for his clothing and there will be a canteen in which refreshments may be bought or any food the men may bring be prepared in readiness for the hour of their meal relief.

GREAT SOUTHERN RAILWAYS COMPANY, IRELAND

Reassuring results—Road service developments—Rolling stock improvements — Modern signalling — Dividend prospects

The annual general meeting of the Great Southern Railways Company was held on Friday last, March 6, at the Gresham Hotel, Dublin, Sir Walter Nugent, Bt. (Chairman of the company) presiding.

The Chairman, in moving the adoption of the report, said that although the result of the year's working was on the whole of a reassuring character, and pointed to continuous and progressive improvement in each branch of the company's business, they felt that disappointment must be felt by those shareholders for whom no dividend was this year available. Owing to the world depression in trade and unregulated road competition, all railways since 1930 had been through a very lean period, and in the case of the G.S.R. this was accentuated by other causes, with which they were familiar. The climax was reached in the years 1932 and 1933, when the interest on the debenture stock only could be paid. When, following the passage of the Road Transport Act of 1933, the company was placed in a more favourable position, considerable arrears of dividends had become due and were accumulating on the guaranteed stock.

The recovery had been quicker than anticipated, and last year the arrears for 1932 were paid off. This year they proposed to pay the arrears for 1933 and 1934, leaving one year's arrears of dividend still to be paid, so that on December 31 of this year two years' interest on the guaranteed preference would be due and payable. If it was then possible, as he hoped it would be, all liabilities under that heading would then have been discharged, and they would enter on a new era when all classes of shareholders would benefit proportionately by the increased earnings and improved position of the company. It should also be borne in mind that in the period under review a considerable amount of arrears of maintenance had to be made up. Also, as the report showed, considerable additions were made to rolling stock as well as to road service vehicles.

Road Merchandise Services

Dealing with the road services, the Chairman said they had taken the fullest possible advantage of the powers conferred on them by the 1933 Act, and they had gone a long way towards acquiring the control of services which were necessary to make the transport of the country the success they hoped and believed it would be. The number of road merchandise licences transferred to the company since 1934 was 223, including 49 on joint account with the Great Northern Railway Company. As a result, 438 road merchandise vehicles were acquired, all of which had been paid for. Final settlement by agreement had been made with 53 ex-licensees in respect of compensation for the transfer of their road merchandise licences.

Regarding finance, the Chairman said that the issue of £637,892 of new debenture stock was authorised at the extraordinary meeting of the company, held on January 10 last, but it had only been found necessary to issue £400,000 for present purposes. They were able to arrange to have that amount of 4 per cent. debentures taken up in one block at par; but in accordance with the promise given by him at the extraordinary general meeting referred to, every shareholder had been given the opportunity of subscribing to this new stock, and it was gratifying to be able to report that up to that morning, the present proprietors had shown their confidence in the future of the company by applying for £197,680.

As to the year's working, there had been a further improvement under all headings. The new premises known as Transport House, in Bachelors Walk, had been completed, and all scattered offices had been got rid of and all road traffic, both passenger and freight, was now ad-

ministered from that one central office. The result had been satisfactory; greater efficiency, more economy, and closer union with the rail services being thus effected.

The year's receipts showed substantial improvement, due mainly to the increased beet traffic, the greater home production of grain, the flour mills, the coal and cattle pact with Great Britain, and also the new manufacturing plants which had sprung up in the Free State. All those factors contributed proportionately to what must be looked upon as a favourable result. The gross receipts from all sources for 1935 amounted to £4,140,958, and showed an increase over 1934 of £283,399. The main items making up this increase were as follows:—Railway increase £147,539, of which £30,138 was from passenger traffic; increase in road transport receipts £125,901; increased receipts in respect of the company's hotels £10,461. The increase in expenditure over 1934 was £195,621, generally spread over the various departments.

New Works

The total net receipts of the company showed an increase of £87,778. It must not be overlooked that the increase in net receipts would have been £47,000 more, except for the withdrawal of the Government contribution in regard to loss on the previously baronially-guaranteed lines. This payment, which approximated to £47,000 annually over a period of ten years, ceased with the year 1934, but, unfortunately, the major portion of the burden remained until arrangements could be made for the closing of certain other unremunerative sections of the railway.

During 1935 23½ miles of track was completely relaid with new rails and new sleepers, and, in addition, 35½ miles of re-sleeping was carried out. Extensive work was in hand in connection with the new junction connecting the old Midland Great Western and Great Southern and Western lines at Glasnevin; alterations to Westland Row station, and the inauguration of a thoroughly modern system of semi-automatic colour light signalling, which eventually would control and protect all trains operating on the lines and through the stations between Lansdowne Road on the old Dublin and South-Eastern section, and Liffey Junction on the old Midland Great Western section. This complete modernisation of signalling work would result in considerable economy.

The main supplies of locomotive coal, to the extent of over 200,000 tons had been obtained from South Wales under free import licences following the Government's coal-cattle pact. A saving of £5,000 was achieved by price reductions in the supplies for the road departments.

Tourist Traffic

The receipts from hotels and refreshment rooms amounted to £110,833, and showed an increase of £10,461, the trading profit being £9,369 compared with £7,891 for the previous year. The returns of tourist traffic for the year were very satisfactory. Both the Tourist Association and the transport companies were making special efforts to make the attractions which Ireland had to offer to visitors known all over the world. The agency which the Great Southern Railways had established in New York was doing good work, and the year into which they were entering they all hoped and believed would be a red letter one as far as the number of visiting tourists was concerned. A great improvement, owing to the activity of the Irish Tourist Association, had been made in hotel accommodation over the entire country, and garage accommodation was available at all the company's hotels.

Under two heads they anticipated increased revenue in the current year: (1) The new trade arrangements con-

cluded with Great Britain, which undoubtedly would lead to greater numbers of cattle being exported to England in the current year; and (2) the fact that much of the business which they last year acquired by purchase from competing concerns on the roads would only begin to affect the earnings this year, and the same applied to the 1936 acquisitions. The receipts from the beet factories and flour mills, &c., should, at any rate, not be less than last year.

Shareholders Remarks

Mr. Corcoran thought that shareholders should back up the efforts of the directors by every practical means as the railway had now emerged from depression and turned the corner safely.

Mr. Nagle believed that there was a future before the company, and if it were properly run the shareholders would get something back.

Mr. Adam Lloyd Blood congratulated the Board, the General Manager, and the staff on the continuous improvement and steady progress shown in each branch of the company's business. Mr. Ward and Mr. Healy also spoke to the same effect.

Senator J. McEllin and Mr. O'Mahony suggested that the improvement in the company's position was due more to legislation than the efforts of the directors. Mr. Claude Chevasse thought the Board was a Dublin Board, and did not represent the interests of the country as a whole. He was against further closing of lines.

Mr. Lorcan Sherlock asked how far work in connection with the Drumm train had progressed, and what was the result.

Chairman's Reply

The Chairman, replying to questions, said that, in conjunction with the Government, they had carried out all the trials of the Drumm trains which they were asked to carry out. They were now in negotiation with the Government and the Drumm people with regard to extending those trains. The report was adopted.

Mr. R. J. Treacy moved a resolution that no fee be paid to the directors until the ordinary shareholders received a dividend of at least 1 per cent. On a show of hands the motion was declared lost, but Mr. Treacy demanded a poll, which it was stated would cost £600.

RAILWAY AND OTHER REPORTS

Grand Union Canal Company.—The directors are unable to recommend a dividend for the past year. No dividend was paid for 1934.

Manchester Ship Canal Company.—Net receipts of the whole undertaking in 1935 were £771,490, and miscellaneous receipts from rents, interest, &c., amounted to £54,674. Deducting miscellaneous charges of £120,625 leaves a net revenue for the year of £705,539, comparing with £709,804 for 1934. The sum of £35,000 is again appropriated to reserve for contingencies and repairs, and the dividends are the same as for 1934, namely, 3½ per cent. on the Manchester Ship Canal Corporation preference stock, 3½ per cent. on the preference shares, and 1½ per cent. on the ordinary shares. The sum carried forward is £32,792, compared with £34,825 brought in. There was an increase of £17,177 in the receipts from Ship Canal tolls, ship dues, and miscellaneous receipts, but expenditure in the working of the Ship Canal showed an increase of £19,698. Net receipts from the company's railways improved by £6,638. Income from the working of the Bridgewater Canals was only £104, a decrease of £5,028.

Canadian Pacific Railway.—The financial statement for the year 1935, published in Montreal on Monday following a meeting of the directors shows that after the deduction of a provision for depreciation of ocean and coastal steamships and the payment of fixed charges, the balance transferred from income account to profit and loss account amounts to \$2,832,083 (£566,416), compared with \$2,686,130 (£537,226) in the previous year. There was an increase in gross earnings of \$4,135,950, and an increase in working expenses, including taxes, of \$6,122,449, leaving a decrease in net earnings of \$1,986,499. Other income increased by \$1,481,701 and fixed charges decreased by \$418,087. Surplus revenue

at December 31, 1934, was \$145,912,721. This, with the addition of the \$2,832,083 (balance of income account for 1935) makes a total of \$148,744,804. From this is deducted a total of \$9,240,110 to meet necessary expenditures, including advances of \$4,000,000 to the Minneapolis, St. Paul & Ste. Marie Railway Company. The directors state that while as a result of operations for the year the company is able to transfer \$2,832,083 from income account to profit and loss account, yet in view of the necessity for conserving its cash resources to meet these necessary expenditures, they deem it inadvisable to declare any dividend in respect of the year 1935.

Consolidated Signal Co. Ltd.—This company, which obtains most of its income from its holding of shares in the Westinghouse Brake & Signal Co. Ltd., showed a profit for the year ended September 30 last of £30,195, com-

pared with £7,373 for 1933-34. This enables all arrears of preference dividends, amounting to 13½ per cent. as from July 1, 1933, to September 30, 1935, and requiring £22,400, to be cleared off. The balance is sufficient, with the aid of £793 brought in, for the payment of 7 per cent. on the ordinary shares, leaving £421 to be carried forward. This is the first ordinary dividend since 1931.

Brown, Bayley's Steel Works Limited.—The directors have decided to distribute one year's dividend on the 5 per cent. cumulative (tax-free) preference shares, leaving the dividend in arrear as from August 1, 1933.

Hoffmann Manufacturing Co. Ltd.—A final dividend is recommended on the ordinary shares of 6 per cent., free of tax, and a cash bonus of 5 per cent., free of tax, making a total distribution of 15 per cent., tax free, for the year ended December 31. For 1934 a dividend of 10 per cent., less tax, was paid.

Some Czechoslovak Railway Figures

Several unusual statistics relating to equipment and operation are given in the report for 1934 of the Czechoslovak State Railways Administration. The section dealing with permanent way states that wooden sleepers on the system numbered 28,021,187, and iron sleepers 409,667, giving an average per track-kilometre of 1,351 wooden and 783 iron sleepers. Rolling stock details show that 40,496 (44·87 per cent.) of the State Railways' goods wagons were braked; braked wagons on private railways worked by the State amounted to 1,030 (29·45 per cent.), and on railways privately owned and operated the corresponding figure was 276 (57·62 per cent.). A fuel consumption table shows that the tonnage of lignite coal burned on lines worked by the State increased by 88,383 (8·02 per cent.) to 1,190,666, closely approaching the 1,466,933 tons

of pit coal. The latter figure represented a decrease of 7·17 per cent. The safety record of State-worked lines remained at its previous excellent standard, the total of two passengers killed in train accidents representing an increase of one, and that of three railwaymen killed, a decrease of one. Injuries to passengers and railwaymen declined by 31 in each case on the State Railways system, and by 35 and 12 respectively on State-worked lines. Other features of the State Railways shown in the report are a maximum altitude of 994·66 m., a maximum gradient of 1 in 17, and a minimum radius of curvature of 70 m. Of the total mileage, 68·78 per cent. is at ground level or on embankment, and 31·22 per cent. in cutting. The total length of the spans of all bridges is 79,493 m.

MINISTRY OF TRANSPORT ACCIDENT REPORT

Dalnaspidal, London Midland & Scottish Railway: August 27, 1935

This accident occurred at about 6.50 p.m. at Dalnaspidal Lodge occupation level crossing, close to Dalnaspidal station, on the former Highland section of the L.M.S.R. The engine of the 4.15 p.m. up express passenger train from Inverness, travelling at about 50 m.p.h., struck a private motorcar which was standing on the crossing foul of the up line. The leading pony wheels of the engine were immediately derailed; fortunately the remaining wheels of the engine and train kept to the rails, the train being brought safely to a stand with the front of the engine 425 yd. beyond the crossing. There were no personal injuries, the driver of the car having succeeded in getting well clear before the impact.

Damage to the engine of the train was confined to the left-hand life-guard and forward foot-step. The motorcar was completely wrecked, and immediately after the impact burst into flames, the major portion being carried on the front of the engine till the latter came to rest; one of the pressed steel front wheels of the car and the bonnet and a portion of the hood became detached and were found on the up side cess a few yards in advance of the crossing. Damage to the permanent way was trifling, only one chair being broken. Re-railment was effected by the breakdown gang from Blair Atholl, and double line working was restored by 9.30 p.m. There was a fine drizzle at the time, and visibility was only moderate.

The line is double through Dalnaspidal station, which is situated 2 miles south of Druimuachdar Summit; the block sections on either side of Dalnaspidal extend to Dalwhinnie, 7½ miles to the north, and to Dalanraoch, 6½ miles to the south. From Dalwhinnie, the gradient is rising continuously in the up direction for 5½ miles, mainly at 1 in 80, to Druimuachdar Summit, 1,484 ft. above sea level, where the long descent southward begins, the first 17 miles at gradients of 1 in 85 to 1 in 70, although through Dalnaspidal station there is an intervening rise at 1 in 294 for half-a-mile. The line approaches Dalnaspidal from the north on a left-handed curve, but is straight through the station itself, after which curvature is again left-handed at 50 ch. radius through the occupation crossing in question, which lies at the south end of the station and crosses the two main lines only. Rail traffic varies from 29 train movements each way in August to 24 up and 13 down in winter, the excess of the up movements over the down being due to banking engines returning light. In the up direction non-stopping passenger trains, a considerable proportion of the total, run through Dalnaspidal station at 45 to

50 m.p.h. on the falling gradient, but down trains do not generally exceed 25 m.p.h.

The crossing was constructed to give access from the main road, about 100 yd. to the east of the railway, to Dalnaspidal shooting lodge, about 250 yd. from the line to the west. Since November, 1934, Dalnaspidal Lodge has been occupied by Balfour, Beatty & Company, contractors for works in connection with the Grampian Electricity Scheme, which firm has erected a hutted camp for its staff on the land adjoining the lodge. All road traffic to and from the camp has to pass over the crossing, but plant and stores for the works are dealt with at a siding on the west side of the station and therefore do not need to cross the railway. There are two heavy lorries permanently attached to the camp for maintenance purposes, and a few private cars owned by members of Balfour, Beatty's staff; the car in question was owned and driven by Mr. I. Douglas, an apprentice engineer employed by the firm.

There are wickets for pedestrians, and the main gates, of iron and 10 feet wide, open away from the railway; these are in fair condition only, and, although originally hung so as to stay in any position, now tend to swing shut by their own weight, the up side gate completely, and the down side gate to a 45 deg. position, leaving just sufficient room for a moderate sized private car to squeeze through without touching; a hook is provided to secure the down side gate in the open position, although the up side gate has to be held open by a stone. There are bolts, which can be padlocked, to secure the gates when closed; it is understood that the former game-keeper was in possession of keys for these gates, although his successor had no knowledge of this, and thorough search had failed to trace the keys. Except for the usual trespass notice on the up side, there are no warning signs.

The railway fence on both sides is of post and wire, and view of approaching up trains from the centre of the crossing or from the down side gate is limited to 560 yd. on account of the curve at the north end of the station, but approaching down trains can be seen for about ¾-mile. From the up side gate, view is much more restricted; up trains are obscured by the station buildings and the water tank on the up platform until the engine is 204 yd. from the crossing, although approaching down trains can be seen for about 450 yd. From a test made from the footplate of the engine concerned in the accident, Major Wilson noted that when approaching along the up line the crossing itself was not at all conspicuous, but it would be reasonable to expect the driver of a through train to see a motor-

car when actually foul of the up main line from a distance of about 400 yd. in clear weather. The up starting signal is 140 yd. north of the crossing, and the up advanced starting signal 160 yd. to the south; the down home signal is adjacent to the crossing, and all these signals are readily visible to drivers of road vehicles from both sides of the line.

Driver C. Clark approached Dalnaspidal station at 45 to 50 m.p.h., a normal speed. All signals were "clear," and in accordance with the usual practice he sounded the whistle at the up distant signal; as he passed the up platform—about 190 yd. north of the crossing—he first saw the car standing on the crossing with its front wheels about the middle of the up line. He immediately made an emergency application of the brake, closed the regulator, and blew the whistle again. Assuming the car was unoccupied, he felt no serious alarm at striking it, thinking the engine would clear it out of his path; he was unaware of any derailment until he reversed the engine, after coming to a stand, in order to disentangle the blazing car from the front. He had worked regularly over this crossing in the summer and had never experienced any trouble at this or any other crossing with cars trying to get across in front of the train. Further evidence as to the collision was given by Fireman P. Munro and Guard D. Wilson. D. MacLennan, Grade I Porter in charge at Dalnaspidal, estimated the present road user of the crossing to be 8 to 12 motor vehicles daily in each direction; these were mostly private cars, but earlier in the year, during construction of the camp, user was appreciably greater, perhaps 15 to 20 vehicles per day, mostly lorries. He said that before the arrival of Balfour, Beatty & Company there were about four or five private motorcars daily in each direction during the shooting season, when the lodge was let, and that user was negligible at other times of the year; there were very few pedestrians. He had never known the gates at this crossing to be locked since he had been at Dalnaspidal; on the other hand, he had known no case of the gates having been left open after use. His evidence with regard to road user was confirmed by Ganger R. Wilson.

Mr. J. Strachan, the stationmaster at Struan, also supervised Dalnaspidal, where Porter MacLennan was in charge; he arrived at Dalnaspidal after the engine had been derailed, and had no subsequent discussion with Mr. Douglas or any other member of Balfour, Beatty & Company's staff. Since the camp had been formed, he had observed that the user of the crossing had "largely increased," but no irregularity had hitherto occurred, and users were particularly careful to keep the gates closed after crossing; having regard to this, he did not think it necessary to call attention to the increased user, which he thought was very light in any

case. He remarked that it was the custom for the employees of Balfour Beatty & Company to park their cars on the level piece of ground adjacent to the up side of the crossing.

Signalman J. Brodie had been a signalman at Dalnaspidal for 3½ years. At the time of the accident he was off duty in the dormitory coach which is stabled in a siding on the up side of the line about 60 yd. from the crossing. His attention being attracted by the whistling, he looked through the side window of the coach and had a glimpse of a motorcar standing on the up main line. He at once ran out, and, on arrival at the crossing, saw Douglas standing about 5 yd. outside the up side gate, which was open; he was, however, emphatic that the down or far side gate was shut.

Signalman P. Ritchie, who had been signalman at Dalnaspidal for 8½ years, accepted the train in question from Dalwhinnie at 6.21 p.m.; it left Dalwhinnie at 6.29 p.m. and passed his box at 6.49 p.m. at a speed of 45-50 m.p.h. As the train was approaching between the up distant and up home signals, he observed that the up line was clear at the crossing. He said the section time from Dalwhinnie for an express train was usually 14-18 minutes, and for a stopping passenger train rather longer; for a goods train it was half-an-hour.

The owner and driver of the car, Mr. I. Douglas, aged 19 years, had resided at the camp since the beginning of the year; by his own account, he had driven a motorcar on and off for about six years in private grounds, but was in possession of a learner's licence only and had always been accompanied when driving on public roads; he was about to submit himself for the usual driving test, with a view to obtaining a full driver's licence. His car had been parked for some time on the level space outside the up side gate of the crossing, and he was taking it into the camp. According to his statement, he first opened the up side, or near, gate and then the far gate, although he could not be certain if he secured the latter with the hook. On his way back across the line he noted that the up line signals had been pulled off for a train, but that no train was approaching; he looked both ways again before getting into the car, and starting the engine, which, although cold, responded readily to the electric starter. He then turned the car and, in bottom gear, drove the few yards to the up side gate, where he stopped, with the front of the car level with the gate posts. He himself would be sitting about 5 ft. further back. In his own words, "I stopped and had a look and then went on, when I heard the train coming." He looked, he said, through the opened flap of the side curtain on his right-hand side towards the Dalwhinnie direction, and went across dead slow in bottom gear. As soon as the front of his car was astride the up main line he saw the train approaching and

thought that he could not get across in time. He tried, he said, to reverse the car off the line but his engine stalled when he let in the clutch after engaging reverse gear. His statement of the above sequence of events was by no means clear, but he remembered getting out of the car before the train struck it, and he said he endeavoured to drag the car clear of the crossing by means of the luggage grid, but without success. On being further questioned, he could not remember definitely whether he actually stopped dead at the up side gate before starting to go across, and later denied hearing the train until it whistled about 30 yd. from him; it was a misty evening, he said, and it was difficult to hear a train coming. He also stated emphatically that he opened the far side gate before attempting to cross, but he admitted that the gate might have swung back to the closed or partially closed position.

Mr. Douglas handed in a written statement by Mr. J. Cummings, an employee of Balfour, Beatty & Company, that immediately before the accident he saw both level crossing gates open and Mr. Douglas sitting in his car.

There is no doubt in the opinion of Major Wilson that this accident was primarily due to lack of elementary caution on the part of Mr. Douglas, and he admits his responsibility. There is nevertheless a regrettable conflict of evidence as to his precise actions immediately before the accident. From his own account, which was supported in this respect by the written statement from Mr. Cummings, he opened both gates before attempting to cross. On the other hand, according to Porter MacLennan, who was an excellent witness, Mr. Douglas stated immediately after the accident that he had left his car foul of the up main line when he went to open the farther side gate; according to Guard Wilson, Mr. Douglas had admitted the accident to be his fault, remarking that his brakes had jammed, and Signalman Brodie was sure that the down side gate was shut. It is indeed difficult to understand how Mr. Douglas, a well-educated man, and trained as an engineer, failed to appreciate the extreme caution so obviously necessary to negotiate this difficult crossing with safety. The view of up trains in daylight and clear weather even from the centre of the crossing is limited to 560 yds.; which would be covered by a through train at 50 m.p.h. in 22 seconds; this time, though short, is, in Major Wilson's opinion, just sufficient, if both gates are open, for a driver, after satisfying himself from the centre of the crossing that no train is approaching, to get to his car standing (with the engine running) level with the up side gate, and drive it clear across. But there is no margin for inattention or hesitant action. Major Wilson can only assume that Mr. Douglas was allowing his mind to wander at a time

when careful concentration on the simple matter in hand was essential, and it can be regarded as purely a matter of good fortune that more serious consequences to the train did not follow. With no speed restriction, Driver Clark was justified in running at his speed on this occasion, and Major Wilson is satisfied that he took prompt action on sighting the obstruction; he is therefore in no way to blame for the accident.

Even when all conditions are favourable, Major Wilson concludes, such as in daylight and clear weather, there is inherent risk in negotiating this crossing from the up side after the up line signals have been cleared, Dalnaspidal and the adjoining block posts always being open for the passage of trains. From the centre of the crossing a fast up train travelling at 50 m.p.h. can be seen for 22 sec. before reaching the crossing, but, as there is no speed restriction, speed may well be appreciably higher, thus shortening the time; on the other hand, if no train is signalled, it should always be safe to cross. When the up line signals are seen to have been cleared, the long block section from Dalwhinnie may involve a wait of a quarter to half an hour before the arrival of a train, and, though this wait would ensure safety, there may be irksome delay.

With the increased user, however, Major Wilson thinks that the risks at this crossing both to road vehicles and to passenger trains, especially with the long periods of winter darkness in this latitude and the prevalence of low cloud and mist, are such that, in addition, special measures are necessary. Since the increased measure of risk is entirely due to the presence of the camp, he recommends that Balfour, Beatty & Co., in consultation with the railway company, should consider the installation of a telephone from the up side of the crossing to the signal box, or, better still, as less liable to misunderstanding, some form of indicator worked by the signalman (in response to a "call attention" bell) signifying whether it is safe to cross or not; in combination with this, a notice-board, displaying suitably worded instructions, would also be desirable. If, however, this arrangement is not found practicable, there is no alternative but to recommend that drivers of motor vehicles approaching from the up side, when up trains are signalled, should be instructed by a notice-board at the crossing, either to proceed to the signal box and inquire whether it is safe to cross (this should not take more than six minutes for the journey both ways on foot), or to wait until the train has passed, in either case accepting the delay, however irksome this may be. Major Wilson admits the difficulties in securing compliance with such instructions at all times, but in an isolated and organised community, such as this camp appears to be, he considers that the enforcement of discipline in such matters should be practicable.

A Notable French Railcar Record

(See also editorial note on page 499)

A remarkable run was made in December last, over the lines of the Alsace-Lorraine and Eastern Railways of France from Strasbourg to Paris, by one of the smaller Bugatti petrol-driven railcars of the Etat ZZy type, when the entire journey of 502 km. (311·7 miles) was completed in 3 hr. 47 min., inclusive of stops intermediately at Nancy and Châlons-sur-Marne, and various speed restrictions. In comparison with this, the best train of the existing timetables—the *rapide* leaving Strasbourg for Paris at 7·28 a.m.—is allowed 5 hr. 12 min., which works out at almost exactly 60 m.p.h. throughout, inclusive of a stop of 5 min. at Nancy; so that the Bugatti improved on this schedule by 1 hr. 25 min. Over the 92·7 miles from Strasbourg to Nancy the time taken was 63½ min.—average, 87·6 m.p.h. start-to-stop—notwithstanding slacks to 50 km. (31 m.) p.h. through Réding, and 115 km. (71½ m.) p.h. through Lunéville. At 8 km. from the start the speed reached 150 km.p.h., and was maintained at that figure up faintly rising gradients; over the next stretch, with inclinations gradually steepening to 1 in 200, speed fell to 130 km. (80½ m.) p.h., immediately prior to the Réding slack. Mundolsheim, 7·3 km. (4·5 m.) from the start, was passed in 4½ min. from the start; Mommenheim, 13·9 miles, in 10½ min.; Saverne, 27·4 miles, in 19½ min.; and Réding, 41·5 miles, in 29 min. from Strasbourg, speed here being reduced, as previously mentioned. Up the 1 in 286 to the summit at Réchicourt speed was maintained at about 140 km. (87 m.) p.h., and from there to Nancy ranged at or slightly above 150 km. (93 m.) p.h., apart from the slight reduction through Lunéville. Réchicourt, 55·0 miles, was passed in 36 min.; Lunéville, 72·5 miles, in 47 min.; and Jarville, 91·7 miles, in 62 min.

A speed of 87 m.p.h. was reached 3 min. after leaving Nancy, in just under 5 km., increasing to 93 m.p.h., and again being sustained for many miles at or about that figure, save for a drop to 87 on the ascent of 1 in 287 from Toul to Pagny. The worst bank on the route is from Léronville up to Loxéville, 9·5 km. (5·9 m.) in length continuously at 1 in 125; this reduced the speed to an absolute minimum of 130 km. (80½ m.) p.h., but the rate of 150 km. was then again resumed until a slowing to 100 km. (62 m.) p.h. through Bar-le-Duc, and for about a mile beyond. With very slight easing through Blesme and Vitry-le-François, speed continued unbrokenly at from 150 to very slightly over 160 km. (93·100 m.) p.h. until the stop at Châlons-sur-Marne. From Nancy, Toul, 20·6 miles, was passed in 14½ min.; Léronville, 39·7 miles, in 27 min.; Loxéville, 47·8 miles, in 32 min.; Bar-

le-Duc, 61·5 miles, in 40½ min.; Vitry-le-François, 91·7 miles, in 60½ min.; and Coolus, 110·3 miles, in 72 min.; Châlons-sur-Marne, 112·0 miles, was reached in 74 min., the start-to-stop speed over this section working out at 90·8 m.p.h.

On the final section, from Châlons to Paris, which is almost perfectly level, there were two bad slowings—first, a permanent way relaying check to 40 km. (25 m.) p.h. near Dormans; and secondly, a signal check to 25 km. (15 m.) p.h. at La Ferté-sous-Jouarre, owing to the car being ahead of time. After the latter, speed was moderate, and 25 km. elapsed before it was allowed again to mount to the 140

km.p.h. mark. From Châlons, Epervay, 19·1 miles, was passed in 13½ min.; Troissy (before the p.w. check), 31·5 miles, in 21½ min.; Chateau Thierry, 48·3 miles, in 33 min.; La Ferté-sous-Jouarre, 66·4 miles, in 45 min.; Meaux, 79·6 miles, in 56½ min.; Lagny, 89·9 miles, in 63½ min.; and Noisy-le-Sec, 101·4 miles, in 71½ min.; Paris, 106·9 miles from Châlons, was reached in 77½ min., the average speed over this stage, with its two severe reductions of speed, working out at 82·8 m.p.h. start-to-stop. The total running time from Strasbourg to Paris, deducting 12 min. spent in stops, was therefore 3 hr. 35 min. for the 311·8 miles, giving a mean speed throughout of exactly 87 m.p.h. For 435 km. (270 miles) of the journey the speed was entirely above the 130 km. (80½ m.) p.h. level; and fully 240 km. (150 m.) were run at 150 km. (93 m.) p.h. and over.

QUESTIONS IN PARLIAMENT

A Liverpool Railway Bridge

Mr. Buchan-Hepburn on March 2 asked the Minister of Transport if he could state, in view of the great inconvenience at present caused to local residents, when the reconstruction of the Booker Avenue railway bridge, Liverpool, would be undertaken; and what the cost of this scheme would be.

Captain A. Hudson (Parliamentary Secretary, Ministry of Transport) replied.—Liverpool Corporation has included the reconstruction of this bridge in its programme of works for the coming financial year. The cost is estimated at £10,000.

Rail v. Road Interests

Captain Strickland on March 4 asked the Minister of Transport whether he was aware of the expense thrown upon applicants for road licences by objections laid by railway companies on the grounds that they were providing transport facilities in the district concerned; whether the licensing authorities in any instances awarded costs against objectors who failed to prove their ability to provide suitable facilities; and, if not, whether he would take steps to provide for this to be done.

Mr. Hore-Belisha.—Parliament gave no power to the licensing authorities to award costs and I would not propose to invite it to review so recent a decision.

Argentine Railways

Sir N. Grattan-Doyle on March 4 asked the President of the Board of Trade whether a commercial counsellor assisted by a Treasury expert would be delegated to represent unorganised bodies of British investors, other than railway shareholders, when the Argentine trade agreement was reconsidered, in order to protect the £300,000,000 of sterilised miscellaneous investments,

in view of the fact that the exchange tax and maize negotiations of the Anglo-Argentine railway directorates had failed to secure a return upon £200,000,000 of Argentine railway capital.

Captain Wallace (Secretary, Overseas Trade Department) replied.—I can assure my hon. friend that His Majesty's Government when undertaking trade negotiations makes full use of the expert advice at its disposal.

Rating of Railways

Mr. Whiteley on March 5 asked the Minister of Health whether it was the intention of the Government to deal with the anomalous position created by the recent decision in the Southern Railway Company's case regarding the rating of railways.

Sir Kingsley Wood.—Until the application which has been made to the Railway and Canal Commission has been determined I am not in a position to make any statement.

Locomotive Headlights

Mr. Leckie asked the Minister of Transport whether he was aware that the L.N.E.R. ran an experimental train between Harrogate and Pilmoor the other day, the engine of which carried a powerful headlamp, and that the driver of the train was most enthusiastic over the result; and whether he would cause further inquiries to be made with a view to the extension of the experiment.

Mr. Hore-Belisha.—I understand that the railway company is using an electrical headlight to enable the driver to see a new type of signal, introduced experimentally on the Boroughbridge branch line, which is fitted with reflectors instead of lamps. I shall keep myself in contact with this experiment in branch line signalling.

NOTES AND NEWS

Canadian Pacific Earnings.—Gross earnings of the Canadian Pacific Railway for the month of January, 1936, amounted to \$9,324,000, an increase of \$1,057,000 in comparison with January, 1935. In the working expenses of \$8,711,000 there was an increase of \$649,000, leaving net earnings \$408,000 higher, at \$613,000.

Plymouth Road Transport.—On Monday, the Plymouth City Council rejected a proposal to discuss the suggested merger of the Plymouth Corporation Transport and the local bus services of the Western National Omnibus Co. Ltd. Reference to the scheme was made on page 424 of our issue of February 28.

Model Railway Exhibition.—An exhibition of the work of members of the Model Railway Club, including locomotives, coaches, wagons, signals, permanent way and working models in all gauges, steam and electric, will be held at the Central Hall, Westminster, from Tuesday, April 14, until Saturday, April 18. Admission to adults will be 1s. 3d. including tax, and children (under 12), 6d.

Vauxhall No. 4 Platform Re-opened.—No. 4 platform at Vauxhall station, which has been closed since November 3 in connection with the Southern Railway £500,000 scheme for improving the permanent way between Waterloo and Surbiton, was re-opened for passengers on Monday last, March 9. The down trains, which have been running non-stop to Clapham Junction, have resumed their calls at Vauxhall. These special temporary arrangements were recorded on page 737 of our issue of November 1 last.

Road Accidents.—The Ministry of Transport return for the week ended March 7 of persons killed or injured in road accidents is as follows. The figures in brackets are those for the corresponding period of last year:—

	Killed, including deaths resulting from previous accidents		Injured
England ...	80	(81)	2,925 (2,890)
Wales ...	4	(6)	118 (124)
Scotland ...	13	(7)	294 (327)
	97	(94)	3,337 (3,341)

The total fatalities for the previous week were 112, as compared with 104 for the corresponding period of last year.

Steam Railcar Competition Result.—To counter the increasing displacement of steam trains by diesel railcars, the Rhenish-Westphalian Coal Syndicate promoted at the end of 1934 a competition for a modern steam car which would equal the proved ability of the diesel. Twenty designs were submitted, and it has now been announced that the first prize has been won by the Fried. Krupp A.G. with a design for a triple-car 180-seater train with a top speed of 80 m.p.h. and an estimated weight of 118 tonnes. An order has

been placed for such a train, and the power equipment will be built at Krupp's Essen works and the carriage portion by the Westwaggonfabrik at Cologne-Deutz.

The National Railway League of Canada.—The National Railway League has been formed at Toronto with the object of "defending the existence of the Canadian National Railways as a publicly owned enterprise." The President is Mr. S. B. Watson, of Toronto and the Executive Secretary, Mr. D. M. Le Bourdaix, of Toronto.

Berlin Traffic in 1935.—The total number of passengers carried by the Stadtbahn, underground railways, trams and buses in Berlin during 1935 was 1,279,300,000, an increase of 4 per cent. over the 1934 total. The Stadtbahn carried 430.3 million passengers; the underground 185 million; the trams 526.1 million; and the buses 137.9 million.

Canadian National Earnings.—For the month of January, 1936, gross earnings of the Canadian National Railways amounted to \$12,742,554, an increase of \$634,968 in comparison with January, 1935. Operating expenses (\$13,318,855) advanced by \$464,945, leaving a deficit of \$576,331, which was \$170,023 higher than that for January, 1935. For the whole year 1935 gross earnings were \$173,184,502, an improvement of \$8,282,000 on 1934, and the net earnings of \$14,258,253 showed an advance of \$1,291,830.

Institution of Railway Signal Engineers.—At the meeting held on March 11 a paper entitled "Remote Control and Operation of Outlying Points" was read by Mr. P. A. Langley, Associate Member. In the discussion the following spoke: Messrs. F. B. Egginton, A. Moss, H. M. Proud, H. H. Dyer, Langley, Sr., and the President, Mr. W. S. Roberts. The paper was accompanied by an excellent series of lantern slides. The President announced that the summer meeting would be held at Liverpool on June 19 and 20, and an evening meeting on May 22 at a place to be decided. The next ordinary meeting would be at Hunt's Bank, Manchester, on April 8.

Railway Station as Occupational Centre.—Railway stations on abandoned lines have been adapted to serve numerous purposes, but the use made of the formerly derelict L.M.S.R. station at Kilbirnie, Ayrshire, strikes an original note. The platform buildings were taken over by the Scottish Community Service, and on March 4 were opened by Sir William Goodchild as the first occupational centre under the Special Areas Scheme. The old waiting rooms and booking office have been fitted throughout with central heating apparatus. A workshop where carpentry and shoemaking is carried

on, a scientific kitchen for female members of the club, and warm spray baths form part of the equipment. Membership of the club is open to the unemployed of the district, and costs one penny a week. The station was disused for five years.

Pennsylvania Railroad and Motor Carriers.—The Pennsylvania Railroad has begun to acquire the businesses of local motor carriers working in the neighbourhood of its railway system, in order to co-ordinate their operations with the rail services, as has been done with many passenger omnibus companies. Already the Pennsylvania Railroad has made an application to the Interstate Commerce Commission for authority to take over three large freight motor transport companies.

Freight Train Radio in America.—The experiments with the use of low-powered radio transmitters for communication between locomotive and brake van on long freight trains which have been carried out in the United States over a period of eighteen months, have now covered 36,000 miles of railway and with the radio in operation for a total of 1,800 hours, on the New York, New Haven & Hartford Railroad. The radio apparatus links the locomotive with the brake van (or caboose in U.S.A. language) sometimes 130 cars distant.

Extension of Electric Traction.—The Netherland Railways have decided to extend their electrified area to include the lines Amsterdam-Arnhem, The Hague - Utrecht, Rotterdam - Gouda, and Utrecht - Eindhoven, a total additional length of 254 km. According to programme, the new services should be inaugurated in May, 1938. This decision has been influenced by the low current consumption of the new streamlined electric rolling stock now in service on the Rotterdam-Hook of Holland line, which is only 75 per cent. of the figure applying to the older stock running on the Dordrecht-Amsterdam, Haarlem-Alkmaar, and Amsterdam-Uitgeest lines. Moreover, the power stations have reduced their current prices.

The Future of Out-Ports.—A paper on the future of out-ports was read to the Industrial Transport Association at Cardiff on March 10 by Mr. Frank Brown, M.Inst.T., Assistant General Manager of the Port of Bristol. With reference to the grouping of docks, Mr. Brown said that the Government's choice of this policy in South Wales, by bringing the docks there under railway ownership, had saved them in recent years from a really desperate position. Even so, as far as coal was concerned, the efforts of the Welsh docks and the railways were largely directed against each other. The future of out-ports would have to be considered in relation to national interests, and he considered that these would eventually prevail against those of the provincial communities now in favour of decentralisation. In the restoration of South Wales to its pre-war prosperity, but on broader lines, it was necessary to have

mutual understanding and an avoidance of internecine activities between the communities and between railway, dock-owning, trading, and ship-owning interests.

Streamlined Locomotive on the Pennsylvania.—What is claimed to be "the most highly perfected and advanced locomotive design yet produced by aerodynamic science for the reduction of wind resistance" has just been completed at the Altoona works of the Pennsylvania Railroad.

New G.W.R. Halt near Oxford.—On Monday last, March 9, a new halt on the Great Western Railway at Cassington, near Oxford, was opened. Most of the local services, including those operated by streamlined diesel railcars, call at the halt, and cheap bookings are available issued to neighbouring towns.

Progress of Railway Bills.—A Select Committee of the House of Commons has been appointed to meet on March 24 under the chairmanship of Sir John Gannon to consider a group of five Bills, including those of the London Midland & Scottish and the Southern Railways. The L.M.S.R. Bill, the second on the list, is due to be considered on the first day of meeting of the committee. The other members of the Committee are Major Sir James Edmondson, Mr. Ben Smith, and Dr. Leech.

Building of Great Danish Bridges Probable.—Messages from Copenhagen state that a scheme sponsored by both the Danish Government and the leading Danish engineering firms is now maturing for the construction of two more great bridges, claimed as the largest in the world. One of these would span the Great Belt, and so connect Funen and Zealand, and would be over 10 miles in length; as well as the Danish State Railways line, it would carry a roadway. The second bridge is proposed to cross the Oeresund and link up Copenhagen with southern Sweden. It is to be hoped that, as in the case of the Storstrøm bridge now under construction, the steelwork will be fabricated in Great Britain.

Launch of New L.M.S. Steamer.—The new turbine steamer *Marchioness of Graham*, which has been built by the Fairfield Shipbuilding & Engineering Co. Ltd., Glasgow, for the L.M.S.R., was launched on Friday last, March 6. The new steamer, which is to be employed on Firth of Clyde, is 231½ ft. long and will have accommodation for 1,300 passengers. Features of her appointment are a first class dining saloon capable of seating 56 persons, smoke room and tea room, and a third class lounge and tea room, in which 42 persons can be seated. Lady Helen Graham, who named the steamer, described her as second only in luxury and in fineness of line to the Cunard White Star liner *Queen Mary*. Sir Alexander M. Kennedy, Chairman and Managing Director of the builders, said that the British railway companies, with their coastal and

pleasure craft, had provided during very depressed years a valuable source of employment, and had thus helped to keep the skilled staff and personnel in touch with the industry. The work placed with shipbuilders by railway companies during 10 years of scarcity of ordinary and naval work had represented several million pounds.

New Welsh Railcar Services, G.W.R.—From Monday, March 16, seven additional passenger services, operated by a new A.E.C. streamlined diesel railcar (No. 13) will be provided daily in the Tenby, Whitland, Carmarthen, Llanelli, and Swansea area. This brings the total number of services operated by these railcars up to 102.

A Large Load on the L.N.E.R.—An exhaust section of a low-pressure turbine cylinder left C. A. Parsons & Company's works at Heaton, Newcastle, on Friday last, March 6, en route to Birmingham. This section, which weighs 30 tons and measures 11 ft. 8 in. by 18 ft. 7 in. by 7 ft. 5 in., is part of a 600-ton plant which is being installed in the Hams Hall power station at Birmingham. The section was hung on longitudinal girders between two L.N.E.R. wagons and just came within the standard loading gauge.

L.M.S. (London) Golfing Society.—The ninth annual dinner of this society was held at the Stephenson Rooms, Euston Hotel, on Friday last, when a company of 61 members and guests assembled. Following an excellent dinner, a musical programme interspersed with interesting speeches, was provided, and the trophies competed for during 1935 were presented to the winners. The chair was occupied by the captain of the society (Mr. E. J. H. Lemon) and amongst the members present were Messrs. A. F. Bound, S. B. Carter, A. W. Donaldson, J. F. Gee, G. Morton, H. V. Mosley, F. Smith, W. A. Stanier, and S. J. Symes. Visitors included Messrs. R. G. Davidson (Southern Railway), C. E. Fairburn, W. K. Wallace, and W. V. Wood.

The King at Clydebank.—A novel feature of the King's recent visit to the *Queen Mary* was the route followed by the special train which conveyed His Majesty from Motherwell to Clydebank. In order to avoid a long succession of dingy tunnels, and with a view to preventing dislocation of the heavy breakfast time traffic on the direct route passing under Glasgow, the royal special was sent to its destination via Coatbridge and Maryhill. The lines traversed are normally used only by goods trains, and abound in sharp curves and steep gradients. The Night Scot arrived at Motherwell at 9.12. The King's saloon was detached, and, together with three other vehicles, was formed into the special train for the remainder of the journey. The train, in charge of L.M.S.R. passenger tank No. 2418, left Motherwell at 9.20 and arrived at Clydebank (L.M.S.R.) station at 10.4. While the shunting operations were taking place at Motherwell the

station was closed to the public. The Tinto residential express was held up outside the station. Schoolchildren cheered the train out of the town.

Testing Colour Vision.—A prize of £50 has been awarded by the Royal Society of Arts to Mr. F. W. Edridge-Green for an improved form of his colour perception lantern, designed to facilitate tests of colour vision under conditions approximating to those met with in everyday practice. The Edridge-Green lantern is already used by several colonial and foreign railways.

New L.N.E.R. Halt at Garrawhill.—The new halt to serve the Garrawhill Garden Estate housing scheme, midway between Shettleston and Easterhouse, will be opened for passenger traffic on Monday next, March 16. The first train to call at the halt will be the 5.20 a.m. Hyndland to Airdrie, due at Garrawhill 5.48 a.m. There will, however, be an official ceremony during the morning.

30th Anniversary of the Bakerloo Railway.—On March 10, 1906, the Baker Street & Waterloo Railway was formally opened by Sir Edwin Cornwall, Chairman of the L.C.C. and, as the 30th anniversary fell this week, the London Passenger Transport Board issued a statement showing the enormous development in traffic during the past three decades. When operation of the line began, 20,000 to 30,000 passengers travelled on week-days. The peak service consisted of three-car trains running every three minutes, and at other times two-car trains were run. Today 170,000 passengers are carried every day. The daily peak traffic, which lasts less than an hour, is equal to half the total daily traffic carried when the line was opened. In thirty years about 1,500,000,000 passengers have travelled on the Bakerloo Railway.

Selling Transport on the G.W.R.—The structure of the Great Western Railway commercial organisation was described by Mr. F. W. Lampitt, Commercial Assistant to the Chief Goods Manager, G.W.R., in the course of a paper on "Selling Transport" read at the City of Birmingham Commercial College on March 9. The system is divided into 15 districts, which are covered daily by the outdoor representatives attached to the staffs of the divisional officers. The representatives present daily reports of their activities, indicating, when necessary, any factors which have militated against their securing traffic for the railway. These reports are immediately examined, and the creation of a more active travel market by improved facilities or modified charges is sought as circumstances dictate. Reports are also made on the state of trade, so that the central executive at Paddington is constantly furnished with a picture of the state of traffic and selling position throughout the line. Frequent conferences of salesmen and station agents ensure the exchange and development of up-to-the-minute ideas for the marketing of railway service.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 10th Week			Totals to Date		
	1936	1935	Inc. or Dec.	1936	1935	Inc. or Dec.
L.M.S.R. (6,917 mls.)	£	£	£	£	£	£
Passenger-train traffic...	368,000	367,000	+ 1,000	3,654,000	3,638,000	+ 16,000
Merchandise, &c. ...	493,000	468,000	+ 25,000	4,518,000	4,384,000	+ 134,000
Coal and coke ...	274,000	266,000	+ 8,000	2,845,000	2,669,000	+ 176,000
Goods-train traffic ...	767,000	734,000	+ 33,000	7,363,000	7,053,000	+ 310,000
Total receipts ...	1,135,000	1,101,000	+ 34,000	11,017,000	10,691,000	+ 326,000
L.N.E.R. (6,336 mls.)						
Passenger-train traffic...	243,000	246,000	- 3,000	2,455,000	2,458,000	- 3,000
Merchandise, &c. ...	321,000	312,000	+ 9,000	3,134,000	3,062,000	+ 72,000
Coal and coke ...	246,000	248,000	- 2,000	2,611,000	2,442,000	+ 169,000
Goods-train traffic ...	567,000	560,000	+ 7,000	5,745,000	5,504,000	+ 241,000
Total receipts ...	810,000	806,000	+ 4,000	8,200,000	7,962,000	+ 238,000
G.W.R. (3,746½ mls.)						
Passenger-train traffic...	153,000	156,000	- 3,000	1,539,000	1,539,000	-
Merchandise, &c. ...	190,000	184,000	+ 6,000	1,798,000	1,758,000	+ 40,000
Coal and coke ...	107,000	103,000	+ 4,000	1,148,000	1,083,000	+ 65,000
Goods-train traffic ...	297,000	287,000	+ 10,000	2,946,000	2,841,000	+ 105,000
Total receipts ...	450,000	443,000	+ 7,000	4,485,000	4,380,000	+ 105,000
S.R. (2,154 mls.)						
Passenger-train traffic...	236,000	235,000	+ 1,000	2,378,000	2,337,000	+ 41,000
Merchandise, &c. ...	55,000	58,500	- 3,500	558,500	575,500	- 17,000
Coal and coke ...	29,000	30,500	- 1,500	380,500	349,500	+ 31,000
Goods-train traffic ...	84,000	89,000	- 5,000	939,000	925,000	+ 14,000
Total receipts ...	320,000	324,000	- 4,000	3,317,000	3,262,000	+ 55,000
Liverpool Overhead ...	1,025	1,088	- 63	11,319	10,942	+ 377
(6½ mls.)						
Mersey (4½ mls.) ...	3,979	3,925	+ 54	41,821	41,128	+ 693
*London Passenger Transport Board ...	535,700	522,600	+ 13,100	19,524,800	19,183,700	+ 341,100
IRELAND						
Belfast & C.D. pass. (80 mls.)	1,619	1,600	+ 19	16,881	17,096	- 215
" " goods	625	519	+ 106	4,928	4,563	+ 365
" " total	2,244	2,119	+ 125	21,809	21,659	+ 150
†Great Northern pass. (543 mls.)	8,600	8,250	+ 350	69,350	66,550	+ 2,800
" " goods	8,550	8,500	+ 50	83,950	80,250	+ 3,700
" " total	17,150	16,750	+ 400	153,300	146,800	+ 6,500
†Great Southern pass. (2,076 mls.)	26,177	23,371	+ 2,806	239,341	227,901	+ 11,440
" " goods	41,056	25,072	+ 15,984	365,715	352,736	+ 12,979
" " total	67,233	48,443	+ 18,790	605,056	580,637	+ 24,419

* 36th week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes.
† 9th week.

Forthcoming Events

Mar. 14 (Sat.).—L.N.E.R. Musical Society, at De Montfort Hall, Leicester, 7.30 p.m. Concert.
Mar. 15 (Sun.).—L.N.E.R. Musical Society, at Royal Hall, Harrogate, 2.30 p.m. Concert.
Mar. 16 (Mon.).—Engineers' German Circle, at Inst. of Mechanical Engineers, Storey's Gate, London, S.W.1, 6 p.m. "Steam Locomotive Research," by Prof. F. Meineke.
G.W.R. (Birmingham) Lecture and Debating Society, at Great Western Hotel, Snow Hill Station, 6.30 p.m. Lecture by Mr. E. Cox.
Institute of Transport (Scottish), at Grosvenor Restaurant, Glasgow, 7.15 p.m. "The Possibility of Transport Co-ordination," by Mr. J. Ness.
Society of Engineers, at Science Museum, Exhibition Road, London, S.W.7, 6 p.m. "James Watt," by Mr. H. Dickinson.
Mar. 17 (Tues.).—Institute of Transport (London), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 6 p.m. "Traffic Congestion—its Effect on Road Passenger Transport in London," by Mr. P. Alexander.
Institution of Civil Engineers, Great George Street, London, S.W.1, 6 p.m. "Some Major Problems in the Utilization of Coal," by Mr. F. Sinnatt.
L.N.E.R. (York) Lecture and Debating Society, at Railway Inst., Queen Street, 7 p.m. "Hadrian's Wall," by Mr. F. Simpson.

Mar. 18 (Wed.).—Diesel Engine Users' Association, at Pagani's Restaurant, 42-8, Great Portland Street, London, W.1, 7.15 for 7.30 p.m. Annual Dinner.
Institute of Transport (Manchester-Liverpool Graduate), at Exchange Station Hotel, Liverpool, 6.45 p.m. "Railway Air Services," by Mr. G. Seddon.
Institution of Civil Engineers, Great George Street, London, S.W.1, 6 p.m. "Welding in Constructional and Repair Work," by Mr. John Miller.
Institution of Structural Engineers (Scottish), at 129, Bath Street, Glasgow, 7.15 p.m. "Welded Bridges," by Mr. A. Moon.
Mar. 19 (Thurs.).—G.W.R. (London) Lecture and Debating Society, at General Meeting Room, Paddington Station, 5.45 p.m. Annual General Meeting.
Institution of Structural Engineers (Yorkshire), at Hotel Metropole, Leeds, 7 p.m. "The San Francisco Bay Bridge," by Prof. J. Husband.
Manchester and District Traffic Association, at Grand Hotel, Aytoun Street, 7.15 p.m. "Some Aspects of Transport Law," by Mr. D. Hartley.
Mar. 20 (Fri.).—Institute of Transport (Leeds Graduate), at Leeds Transport Department, 7 p.m. Debate: "That the Electrification of the Railway System of Great Britain is Desirable."
Institution of Engineers and Shipbuilders in Scotland, Assoc. of Students, Glasgow, 8 p.m. "A Description of St. Rollox Locomotive Works," by Mr. E. Catchpole.

British and Irish Railways Stocks and Shares

Stocks	Highest 1935	Lowest 1935	Prices	
			Mar. 10, 1936	Rise Fall
G.W.R.				
Cons. Ord.	55½	44½	48	-1½
5% Con. Prefce.	124	108	120½	—
5% Red. Pref. (1950) ..	117	106¾	108½	—
4% Deb.	118½	108	115	-½
4½% Deb.	122	110	117½	—
4½% Deb.	140½	118	127½	—
5% Deb.	140½	130	140½	—
2½% Deb.	82½	68½	77	—
5% Rt. Charge	137	128	134½	—
5% Cons. Guar.	136¾	120½	131½	-½
L.M.S.R.				
Ord.	25½ ¹⁶	16	22	-½
4% Prefce. (1923)	58½	43½	65½	-½
4% Prefce.	87½	73½	84	—
5% Red. Pref. (1955) ..	107	97¾	105½	—
4% Deb.	110¼	99½	107½	+½
5% Red. Deb. (1952) ..	119½ ¹⁶	111½ ¹⁶	118½	—
4% Guar.	105½	95½	103	—
L.N.E.R.				
5% Pref. Ord.	157½	84	101½	—
Def. Ord.	79½ ¹⁶	48	5½	-½
4% First Prefce.	74¾	48	65*	—
4% Second Prefce.	31½	16¼	24½	—
5% Red. Pref. (1955) ..	92¼	71	88½*	+2
4% First Guar.	103½ ¹⁶	93	100½	-½
4% Second Guar.	98¾	82½	93	-½
3% Deb.	86	75	81	—
4% Deb.	109¼	98½	106	-½
5% Red. Deb. (1947) ..	118½	106½	114½	-1
4½% Sinking Fund Red. Deb.	112½	108	110	—
SOUTHERN				
Pref. Ord.	87½	69½	92	+1
Def. Ord.	25½ ¹⁶	16¾	23	-1
5% Prefce.	124	108¼	120½	—
5% Red. Pref. (1964) ..	117¾	109½	116½	—
5% Guar. Prefce.	136½	121½	132½	—
5% Red. Guar. Pref. (1957) ..	121¼	112½	116½	—
4% Deb.	116¾	107	114	-1
5% Deb.	138	130¼	138½	—
4% Red. Deb.	115	106½	115½	—
1962-67				
BELFAST & C.D.				
Ord.	9	4	9	—
FORTH BRIDGE				
4% Deb.	111¼	104½	104½	—
4% Guar.	109½	104	104½	—
G. NORTHERN (IRELAND)				
Ord.	20	7	16	-½
G. SOUTHERN (IRELAND)				
Ord.	57½	14½	45½	—
Prefce.	50	25¼	49½	-½
Guar.	88¾	51¼	92¼	—
Deb.	86¼	70	88½	—
L.P.T.B.				
4½% "A"	130	119¾	125½	—
5% "A"	139¾	130	135½	-1
4½% "T.F.A."	113¾	108	110	—
5% "B"	131½	122¾	127½	-1
"C"	109½	91	106	—
MERSEY				
Ord.	23½	9¼	27½	+1
4% Perp. Deb.	100½	93½	97½	—
3% Perp. Deb.	75½	67	76	—
3% Perp. Prefce.	62	47¼	64½	—

* ex dividend

CONTRACTS AND TENDERS

Locomotives for Egypt

W. G. Bagnall Limited has received an order from the Egyptian State Railways Administration for 15 2-4-2 tank locomotives, 4 ft. 8½ in. gauge, for service on light agricultural lines.

Locomotives for South Africa

The South African Government Railways & Harbours Board has placed orders for 24 class 15E 4-8-2 locomotives divided as follows: Henschel & Sohn 16; and Berliner Maschinenbau A.G. vormals L. Schwartzkopf, eight. These locomotives are of the same type as those recently delivered by Robert Stephenson & Co. Ltd., as described and illustrated in our issue of January 10, pp. 64-66.

Locomotives and Wagons for the Gold Coast

The Crown Agents for the Colonies have placed the following orders for locomotives for the 3-ft. 6-in. gauge lines of the Gold Coast Government Railway: Nasmyth, Wilson & Co. Ltd., three 4-8-2 tender locomotives; Hunslet Engine Co. Ltd., two 0-8-0 tank locomotives.

The Gloucester Railway Carriage & Wagon Co. Ltd. has received an order from the Crown Agents for the Colonies for 40 25-ton bogie low-sided wagons for the 3 ft. 6 in. gauge lines of the Gold Coast Government Railway.

Orders for German Wagon Industry

A group of German wagon manufacturers has been awarded an order for 100 goods wagons by the Portuguese East-Africa Railway Administration, says the *Deutsche Bergwerks Zeitung*.

Henry Berry & Co. Ltd. has received an order for a 200-ton hydraulic wheel press for the Leopoldina Railway.

China Buys Japanese Locomotives and Wagons

General Yen Hsi-shan has ordered for Shansi Province 337 passenger coaches and goods wagons for use on the Taiyuan-Puchow railway, learns Reuters Trade Service from Continental papers. The contract was concluded in Taiyuan with representatives of the Dairen Engineering Works and the Japan Wagon Factory. The Nanking Government is understood to have ordered 15 locomotives for the Lunghai Railway from the South Manchuria Railway Company; the value of this order is 1,600,000 yen.

The Bengal-Nagpur Railway Administration has placed the following orders:—

William Asquith Limited, one locomotive tyre drilling machine.

Noble & Lund Limited, two wheel lathes.

Churchill Machine Tool Co. Ltd., carriage and wagon axle journal regrounding machine.

Butler Machine Tool Co. Ltd., one spur gear planing machine.

Leyland Motors Limited has recently received the following orders from railway and railway-associated road transport operators:—

Crosville Motor Services Limited, six oil-engined Titans.

Great Southern Railways, Ireland, four Cubs.

South African Railways and Harbours Board, 17 Beaver-Six tractors.

B. & S. Massey Limited has received an order for one 25-cwt. steam hammer for the Leopoldina Railway.

Copper for L.N.E.R.

The L.N.E.R. has placed some large orders for copper required in connection with the important locomotive building programme now being carried out by the L.N.E.R. at the works at Doncaster and Darlington. These orders comprise 50 tons of copper pipes and 950 tons of copper plate or rod, divided amongst the undermentioned firms: I.C.I. Limited and its associated companies; Thos. Bolton & Sons Ltd.; C. Clifford & Son Ltd.; Birmingham Battery & Metal Co. Ltd.; Hudson & Wright Limited; Wilkes Sons & Mapplebeck Ltd; Yorkshire Copper Works Limited; and P. & W. MacLellan Limited.

The L.N.E.R. has placed the following orders for Scottish fir sleepers: C. Morgan & Sons, 3,000 sleepers; A. & R. Brownlie, 8,000 sleepers; and J. T. Ellis, 800 sleepers. For seasoning the sleepers in preparation for use in the permanent way an order has been placed with H. Unwin & Company for 30,000 gallons of creosote oil.

Electrification of Newcastle-South Shields Branch, L.N.E.R.

The L.N.E.R. has placed contracts for the supply of steel conductor rails for use in connection with the electrification of the Newcastle-South Shields branch. Dorman Long & Co. Ltd. is to supply 1,180 tons and the Cargo Fleet Iron Co. Ltd. is to supply an equal quantity.

Metropolitan-Vickers Electrical Co. Ltd., Belfast, has received a part contract from the L.M.S.R. Northern Counties Committee for Cosmos electric lamps.

The Tilley Lamp Company has received an order from the Egyptian State Railways for 100 type OL50 outdoor suspension lamps and 60 type PL55 general utility lamps.

Nicholson & Fieldsend Limited has received an order from the Madras & Southern Mahratta Railway for 1,500 helical springs for carriages and wagons, to be supplied to the inspection of Messrs. Rendel, Palmer & Tritton.

The recently announced decision of Stewarts and Lloyds Limited to close the Phoenix works at Rutherglen, near Glasgow, has given rise in some quarters to the impression that the company is not in complete accord with the policy

pursued during the last four years by the British Iron and Steel Federation, with the support of the Import Duties Advisory Committee, and the Government, to develop the production of iron and steel in this country to the maximum possible extent. We are authorised to state that this is incorrect. Much as the company regrets the necessity for closing the works, the decision has been forced upon it by the growing intensity of world competition in tube manufacture in recent years. In order to meet this competition the company has erected new works on its ore field at Corby, where it is now producing steel tubes and other products under advantageous conditions and with efficient modern plant. This development, which has been helped by the tariff policy of this country, has already led to an increase in employment resulting not merely from the growth of the company's export trade, but still more from the manufacture in this country of basic Bessemer steel, formerly obtainable only from the Continent. The Phoenix works are not geographically suited to be supplied with raw material from the new works, and it has therefore been found necessary to concentrate the manufacture of the bulk of the tubes formerly made there in the Corby works. The balance will be transferred to other works of the company in Scotland. The company has endeavoured to minimise the disturbance to local employment by the transfer of as many workpeople as possible.

Soviet Orders in Great Britain

The orders placed in Great Britain during January, 1936, amounted to £255,214. The table below shows the value of each category of engineering and allied materials, as well as corresponding figures for January, 1935.

	January, 1935	January, 1936
Machinery and equipment ..	52,689	28,786
Ferrous alloys and steel ..	154,789	2,561
Non-ferrous metals ..	187,715	125,418
Rubber ..	1,166	948

The total Soviet purchases in Great Britain during the year 1935 amounted to £9,977,600, of which £2,118,900 was in respect of machinery and equipment.

Details of the purchases of engineering and allied equipment and materials are given below, according to categories, the values given being in thousands of pounds sterling.

	1932	1933	1934	1935
Machine tools ..	598.6	357.5	653.7	432.0
Electric power equipment ..	519.5	32.0	26.0	12.4
Boilers and parts ..	57.9	46.0	—	—
Turbines and parts ..	40.7	1.0	—	—
Internal-combustion engines ..	51.2	4.0	56.5	15.7
Metallurgical equipment ..	307.8	27.0	22.2	41.6
Cranes and hoisting equipment ..	141.1	1.0	26.6	1.8
Excavators ..	128.9	—	72.0	2.2
Locomotive and transport equipment ..	223.2	—	7.5	391.0
Pumps and compressors ..	139.9	51.0	71.7	30.9
Presses and hammers ..	31.4	17.0	46.8	34.4
Wheelmaking plant ..	190.0	—	—	—
Woodworking machinery ..	2.7	6.0	4.0	6.2
Precision instruments and radio equipment ..	86.2	38.0	30.5	90.2
Grinding wheels ..	—	—	54.0	60.3
Telephone equipment ..	—	—	2.2	99.5
Tyre plant ..	—	—	—	53.6

LEGAL AND OFFICIAL NOTICES

In the Court of the Railway Rates Tribunal.

**Road and Rail Traffic Act, 1933.
Agreed Charges.**

NOTICE IS HEREBY GIVEN that Applications for the approval of Agreed Charges under the provisions of Section 37 of the Road and Rail Traffic Act, 1933, short particulars of which are set out in the Schedule hereto, have been lodged with the Railway Rates Tribunal.

The said Applications may be inspected at the Office of the Tribunal, Bush House, Aldwych, London, W.C.2, at any time during office hours and at the following places:—

LONDON: Railway Clearing House, 123, Seymour Street, N.W.1.
BIRMINGHAM: District Goods Manager's Office, Snow Hill, Great Western Railway.
CARDIFF: Divisional Superintendent's Office, Great Western Railway.
EXETER: Western Divisional Superintendent's Office, Southern Railway.
LEEDS: District Goods Manager's Office, Wellington Street, London & North Eastern Railway.

LEICESTER: District Goods and Passenger Manager's Office, London Midland & Scottish Railway.

MANCHESTER: District Goods Manager's Office, Hunt's Bank, London Midland & Scottish Railway.

SOUTHAMPTON: Southern Divisional Superintendent's Office, Southampton Central, Southern Railway.

YORK: Goods Manager's Office, London & North Eastern Railway.

ABERDEEN: District Goods and Passenger Manager's Office, London Midland & Scottish Railway.

EDINBURGH: District Goods and Passenger Manager's Office, Waverley Station, London & North Eastern Railway.

GLASGOW: Commercial Manager's Office, Central Station, London Midland & Scottish Railway. A copy of each Application lodged with the Tribunal can be obtained from Mr. G. Cole Deacon, Secretary, Rates and Charges Committee, 35, Parliament Street, Westminster, London, S.W.1, price 1s., post free.

Notices of objection by any parties entitled to object to the approval of any of the said Agreed Charges must state concisely the

grounds of objection and must be filed at the office of the Registrar, Bush House, Aldwych, London, W.C.2, on or before the 27th day of March, 1936, and a copy thereof on or before the same day served on or sent by registered post to Mr. G. Cole Deacon, at the above address. A separate Notice must be filed and served in respect of each Application.

Each Notice filed must be on foolscap size paper and must be stamped with an adhesive fee stamp for 2s. 6d. (which can be purchased at the office of the Tribunal only). If sent by post for filing each Notice must be accompanied by a Postal Order for 2s. 6d. payable to the Registrar when a stamp will be affixed at the office. A Notice by a Representative Body of Traders must contain a statement of the facts upon which such Body claims to represent a substantial number of traders interested in, or likely to be affected by the decision on, the application.

Five additional copies of each Notice must be lodged with the original at the office of the Registrar.

T. J. D. ATKINSON,
Registrar.

4th March, 1936.

Number of Application and Date of Lodgment	Parties to Agreement	Nature of Agreed Charge
1936, No. 109— Feb. 10, 1936	THE CO-OPERATIVE WHOLESALE SOCIETY, LTD., 1, Balloon Street, Manchester, and the Midland and Great Northern Joint Committee and the L. & N.E. Railway Co.	Per ton. Preserves; Cheese in cartons; Potato Crisps; Cooked Meat; Sausages; Meat Pies; Advertising Matter.
1936, No. 110— Feb. 10, 1936	THE EFANDEM CO. LTD., Fallings Park, Wolverhampton, and the G.W. and L.M. & S. Railway Cos.	Per ton. Electric Torches or Lamps; Accumulators and Accumulator Parts; Carbon Dust; Battery Cells; Torch and Lamp Cases; Carbon Plates and Rods; Returned Empties as defined in the General Classification of Merchandise returned to Suppliers; Empty Cases, Crates and Trays.
1936, No. 112— Feb. 28, 1936	<i>Applicable also to Traffic consigned by eight Associated or Subsidiary Companies.</i> PERCY DAWES & SONS, 77, Nottingham Road, Alfreton, and the G.W., L. & N.E., L.M. & S., and Southern Railway Cos., and L.P.T.B. <i>This Application, by leave granted under Rule 4, relates also to Agreed Charges with six other Registered Bacon Curers in Great Britain as specified therein.</i>	Per Live Pig. Live Pigs consigned to Registered Bacon Curers or their Agents.
1936, No. 113— Feb. 28, 1936	ARTHUR DAVY & SONS LTD., Paternoster Row, Sheffield, 1, and the G.W., L. & N.E., L.M. & S., and Southern Railway Cos., and L.P.T.B.	Per Live Pig. Live Pigs consigned to the Trader or his Agent.
1936, No. 114— Feb. 28, 1936	BÜCHER & HASELER LIMITED, Branton Street, Birmingham, 18, and the G.W. and L.M. & S. Railway Cos.	Per ton. Aluminium Ware; Enamelled Ware; Hardware; Hollow-ware; Metal Pressings; Spinnings and Stampings; Springs; Returned Empties as defined in the General Classification of Merchandise returned to Suppliers.
1936, No. 115— Feb. 28, 1936	THE CALOR-GAS (DISTRIBUTING) CO. LTD., 17 18, Margaret Street, London, W.1, and the G.W. and L. & N.E. Railway Cos.	Per cylinder of Gas. Butane Gas in cylinders not exceeding 56 lb. each in weight (when filled).
1936, No. 116— Feb. 28, 1936	THE EVER READY CO. (GREAT BRITAIN) LTD., Hercules Place, Holloway, London, N.7, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per ton. Accumulators and Accumulator Parts; Dry Cells and Batteries; Electric Lamps and Torches; Raw Materials, such as Zinc, Manganese and Graphite; Returned Empties as defined in the General Classification of Merchandise returned to Suppliers.
1936, No. 117— Feb. 28, 1936	WILLIAM GOODACRE & SONS LTD., Cevlon Mills, Russell Road, Victoria Docks, London, E.16, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per ton. Carpeting, Rugs, Mats, Matting and Advertising Matter.
1936, No. 118— Feb. 28, 1936	JAMES BROTHERS & SONS LTD., Commercial Street, Northampton, and the L.M. & S. Railway Co.	Per ton. Confectionery; Fruit Drinks; Groceries, Preserves and Provisions, such as those included in Exceptional Rates Lists G, H, S and T, as defined in the General Classification of Merchandise.
1936, No. 119— Feb. 28, 1936	THE JEVES' SANITARY COMPOUNDS CO. LTD., Richmond Street, Plaistow, London, E.13, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per ton. Disinfectants (Fluid or Solid), Insecticides, Soap, Toilet Paper and Holders, Articles for advertisement.
1936, No. 120— Feb. 28, 1936	ANDREW LEVY & CO. LTD., Bowershall Mills, 79, Bonnington Road, Leith, and the L. & N.E. and L.M. & S. Railway Cos.	Per ton. Stationery.
1936, No. 121— Feb. 28, 1936	HARRY PECK & CO. LTD., 8, Devonshire Grove, Old Kent Road, London, S.E.15, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per ton. Preserves and Provisions such as those included in Exceptional Rates Lists S and T, as defined in the General Classification of Merchandise; Advertising Material.
1936, No. 122— Feb. 28, 1936	F. PLUCK, Dodnash, Thoroughgood Road, Clifton-on-Sea, and the L. & N.E. Railway Co.	Per ton. Leaf Mould, Potting Soil, Sand, Manure, Compost and Wood Ash, packed.
1936, No. 123— Feb. 28, 1936	JOHN SHARP, Highfield Mill, Cleckheaton, and the L. & N.E. and L.M. & S. Railway Cos.	Per ton. Stitching Wire.
1936, No. 124— Feb. 28, 1936	B. BERWIN LIMITED, Templar Buildings, Templar Street, Leeds, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing.
1936, No. 125— Feb. 28, 1936	BRADFORD TEXTILE CO. LTD., St. Blaize Works, Snowdon Street, Bradford, Yorks, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing and Caps.
1936, No. 126— Feb. 28, 1936	FISHER, CLARK & CO. LTD., Boston, Lincolnshire, and the L. & N.E. Railway Co.	Per package. Labels, Tickets and Post Cards.
1936, No. 127— Feb. 28, 1936	HOWARD FORD & CO. LTD., Russell Buildings, School Lane, Liverpool, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per package. Hosiery.
1936, No. 128— Feb. 28, 1936	THE NATIONAL ASSOCIATION OF LOCAL GOVERNMENT OFFICERS, 24, Abingdon Street, London, S.W.1, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per package. Monthly Magazines "Nalگو."
1936, No. 129— Feb. 28, 1936	JOHN NOBLE LIMITED, Brook Street, Manchester, and the Cheshire Lines Committee, and the G.W., L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing, Drapery and General Stores Wares.
1936, No. 130— Feb. 28, 1936	EDWARD PARSONS & SON LTD., The Farmhouse, Irchester Village, Wellingborough, and the L.M. & S. Railway Co.	Per ton. Meat Pies, Preserved Provisions and Sausages.
1936, No. 131— Feb. 28, 1936	POOL, LORIMER & TABBERER LIMITED, Leicester, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Hosiery.
1936, No. 132— Feb. 28, 1936	JOHN SMEDLEY LIMITED, Lea Mills, nr. Matlock, Derbyshire, and the L.M. & S. Railway Co.	Per package. Hosiery, Yarn and Advertising Matter.
1936, No. 133— Feb. 28, 1936	WHITELEY ELECTRICAL RADIO CO. LTD., Victoria Street, Mansfield, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Wireless Component Parts.
1936, No. 134— Feb. 28, 1936	EDWARD CURRAN & CO. LTD., Hurman Street, Cardiff, and the G.W. Railway Co.	Per ton. Enamelled Holloware.

Legal and Official Notices—continued

Number of Application and Date of Lodgment	Parties to Agreement	Nature of Agreed Charge
1936, No. 135— Feb. 28, 1936	THOMAS HEDLEY & CO. LTD., Phoenix Buildings, Collingwood Street, Newcastle-on-Tyne, and the L. & N.E. Railway Co.	Per ton.
1936, No. 136— Feb. 28, 1936	KIA-ORA LIMITED, 35/38, Rushworth Street, Blackfriars, London, S.E.1, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Candles, Soap and Soap with articles for advertisement. Per ton.
1936, No. 137— Feb. 28, 1936	JOHN NOBLE LIMITED, Brook Street, Manchester, 1, and the Cheshire Lines Committee and the G.W., L. & N.E., and L.M. & S. Railway Cos.	Cordials, British Wines, Oranges, Lemons and similar Fruit, Tomato Cocktails, Show Cards, Coolers, Wine, Returned Empties as defined in the General Classification of Merchandise returned to Suppliers.
1936, No. 138— Feb. 28, 1936	W. W. OSGERBY LIMITED, Hedon Road, Hull, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing, Drapery and General Stores Wares.
1936, No. 139— Feb. 28, 1936	A. SANDERSON & CO. LTD., Kingston Colour Paint and Varnish Works, Hull, and the L. & N.E. and L.M. & S. Railway Cos.	Per ton. Bath Salts, Cleansing Powder, Dry Soap and Lavatory Cleanser. (i) Creosote, Earth Colours, Glue, Linseed Oil, Lead (Red and White), Pitch, Plaster, Pumice, Putty, Whiting, in consignments not exceeding 2 tons each in weight; Dry Colours, Distempers, Dryers, Paints, Advertising Material, new empty tins. (ii) Thinners, Turpentine and Varnishes other than in Tank Wagons.
1936, No. 140— Feb. 28, 1936	STEPS AND TABLES LIMITED, Melbourne Street, Gloucester, and the G.W. and L.M. & S. Railway Cos.	Per ton. Chairs, Joiner's Work, Ladders and Tables.
1936, No. 141— Feb. 28, 1936	BROWN & HAIGH, Wood Street Mills, Wigan, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Cloth and Clothing.
1936, No. 142— Feb. 28, 1936	CO-OPERATIVE WHOLESALE SOCIETY LIMITED, 1, Balloon Street, Manchester, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Hosiery.
1936, No. 143— Feb. 28, 1936	THE KETTERING CLOTHING MANUFACTURING CO-OPERATIVE SOCIETY LIMITED, Dryden Street, Kettering, and the L.M. & S. Railway Co.	Per package. Clothing.
1936, No. 144— Feb. 28, 1936	MORRIS & SON, Dale Street, Shipley, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing, Drapery and General Stores Wares.
1936, No. 145— Feb. 28, 1936	"MORRIS BIG VALUE CLUB," 24, Salfaire Road, Shipley, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing, Drapery and General Stores Wares.
1936, No. 146— Feb. 28, 1936	"TWO STEEPLES" LIMITED, Wigston, and the L.M. & S. Railway Co.	Per package. Woollen Goods.
1936, No. 147— Feb. 28, 1936	APLIN & BARRETT LIMITED, Yeovil, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per ton. Butter, Cheese, Cream, Eggs, Sausages, Meat Pies, Cooked Meats, Preserved Meat, Preserved Fish, Condensed Milk, Ivelcon (Meat and Vegetable Extract), Honey, Christmas Puddings, Show Cards (unframed), Printed Advertising Matter and Stationery.
1936, No. 148— Feb. 28, 1936	Applicable also to traffic consigned by one Associated or Subsidiary Company. FULLERS LIMITED, Hammersmith, London, W.6, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per package. Cakes and Confectionery, also small parcels of packing material and equipment sent to Trader's Branches.
1936, No. 149— Feb. 28, 1936	W. H. SMITH & SON LTD., Strand House, London, W.C.2, and the L.M. & S. Railway Co.	Per package. Books and Stationery; Newspapers and Periodicals published at regular intervals.
1936, No. 150— Feb. 28, 1936	W. TREVOR WATKINS, Ystrad Mynach, and the G.W., L. M. & S. and Southern Railway Cos.	Per head. Cattle, Calves, Pigs and Sheep, for slaughter.
1936, No. 151— Feb. 28, 1936	BUTLER SERVICES LIMITED, Riverside Works, Shipley, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing, Drapery and General Stores Wares.
1936, No. 152— Feb. 28, 1936	LAWLEYS LIMITED, 36, Golden Square, London, W.1, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos., and L.P.T.B.	Per ton. China, Earthenware; Glassware; Brassware; Hardware; Pewterware; Leather and Fancy Goods; Clocks and Watches; Plate, Jewellery and Cutlery; Articles for use in the Trader's shops; to the Traders' Branch Shops.
1936, No. 153— Feb. 28, 1936	NURSERY FURNISHINGS LIMITED, Philip Road, Peckham Rye, London, S.E.15, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per ton. Bedsteads, Children's Chairs, Children's Cots, Mattresses, Perambulators; Returned Empties as defined in the General Classification of Merchandise returned to Suppliers.
1936, No. 154— Feb. 28, 1936	Applicable also to traffic consigned by one Associated or Subsidiary Company. TRIUMPH ENGINEERING COMPANY, Priory Street, Coventry, and the L.M. & S. Railway Co.	Per Motor Bicycle. Motor Bicycles (complete).
1936, No. 155— Feb. 28, 1936	UNITED WATER SOFTENERS LIMITED, Permutit House, Gunnersbury Avenue, London, W.4, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per ton. Domestic Water Softening Plant; Water Softening Materials; Water Samples in bottles; Show Cases; Advertising Matter; Returned Empties as defined in the General Classification of Merchandise returned to Suppliers.

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OFFICIAL ADVERTISEMENTS.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to—The Railway Gazette, 33, Tothill Street, Westminster, London, S.W.1.

RAILWAYS IN 1845.—The Railway Club held its annual general meeting on February 20, when Mr. Kenneth Brown gave his presidential address on "British Railways in 1845." Illustrating his remarks with lantern slides, the President referred to the position of railways at the end of 1844 and dealt with the new lines opened in 1845, especially the extension in East Anglia from Bishops Stortford to Norwich. The clash between Stephenson's 4-ft. 8½-in. gauge and Brunel's 7-ft. gauge came to a climax in this period, the doom of

the broad gauge being sealed by the passing of the Gauge Act, 1846. Outstanding locomotive types mentioned were Stephenson's long-boilered design and Allan's Crewe design, and the failure of atmospheric traction on the South Devon Railway was described. Mr. Brown referred to the unhappy lot of the third class passenger of those days and the legislation creating the "Parliamentary" train. Concluding with a description of the Railway Mania and the clash between George Hudson, "the Railway King," and W. E. Gladstone,

Mr. Kenneth Brown drew attention to the great impetus given by the activities of Hudson to the development of British railways.

Forthcoming Meetings

March 25 (Wed.)—**Grand Union Canal Company** (Ordinary General), 5, Lloyd's Avenue, E.C., at 12 noon.

May 6 (Wed.)—**Canadian Pacific Railway Company** (Annual General), Head Office, Montreal, at 12 noon, followed by Special Meeting.

Railway Share Market

Conditions in the stock and share markets have been unsettled by the developments in the European political situation. Prices were marked down rather sharply on Monday, but selling pressure has not been pronounced and the prevailing tendency has since been towards recovery. The stocks of the main line railways were affected by general market conditions and were inclined to be less active in view of the resumption of wage negotiations.

L.M.S. stocks probably attracted chief attention, aided by the further good traffic return showing an increase of £34,000. The 4 per cent. preference at 83½ is within a point of the price ruling a week

ago and the 1923 preference is 64½ against 66½. The 4 per cent. debenture stock kept at 107. L.N.E. stocks were also quite active, although they are below the prices ruling a week ago. Great Western ordinary are 48 against 49, but continued to find buyers on any reaction in the price in view of the apparently attractive yield offered and the favourable possibilities of the dividend again being 3 per cent. for the current year. Southern preferred went back rather sharply on disappointment with the £4,000 decrease in the traffic return, but at 91 the price is only a half a point lower than a week ago. On the other hand, the deferred were reactionary with a decline on balance from

24 to 22½. The 5 per cent. preference have moved down from 121 to 119½. London Transport "C" held up relatively well, the traffic increase of £13,000 being a favourable influence. Metropolitan reflected the general tendency to lower prices and were lowered to 84, which, however, is only a half point below the figure ruling a week ago.

The foreign railway market has again been inactive and movements were against holders, although subsequently the lower levels of various stocks, including B.A.G.S. and B.A. Western, brought in buyers and prices showed fractional improvement. Cordoba Central debentures also made a rather better price later on. San Paulo and Leopoldina issues were on offer. Canadian Pacific were little changed but the preference reacted on the dividend decision.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1935-36	Week Ending	Traffic for Week		No. of Weeks	Aggregate Traffic to Date			Shares or Stock	Prices					
				Total this year	Inc. or Dec. compared with 1935		Totals		Increase or Decrease		Highest 1935	Lowest 1935	Mar 10, 1936	Yield (See Note)		
							This Year	Last Year								
South & Central America.	Antofagasta (Chili) & Bolivia	834	8.3.36	13,700	4,190	10	138,440	122,330	+	16,110	Ord. Stk.	23	141½	22½	Nil	
	Argentine North Eastern ..	753	7.3.36	7,268	365	36	280,260	260,325	+	19,935	"	7	4	5	Nil	
	Argentine Transandine ..	—	—	—	—	—	—	—	—	—	A. Deb.	49½	30	50	8	
	Bolivar ..	174	Feb., 1936	6,650	50	9	12,150	12,450	—	300	6 p.c. Deb.	13	5	10	Nil	
	Brazil ..	—	—	—	—	—	—	—	—	—	Bonds.	14	11	14	39½	
	Buenos Ayres & Pacific ..	2,806	7.3.36	100,940	5,688	36	2,898,044	2,635,679	+	262,365	Ord. Stk.	101½	47½	81½	Nil	
	Buenos Ayres Central ..	190	22.2.36	991,900	10,100	34	3,933,806	3,832,300	+	101,506	Mt. Deb.	21	10	17½	Nil	
	Buenos Ayres Gt. Southern ..	5,081	7.3.36	163,102	25,787	36	4,661,320	5,087,356	—	426,036	Ord. Stk.	27	13½	18	Nil	
	Buenos Ayres Western ..	1,930	7.3.36	48,414	49	36	1,586,218	1,570,189	+	16,029	"	24	10	15	Nil	
	Central Argentine ..	3,700	7.3.36	110,329	701	36	4,359,970	4,238,975	+	120,995	"	177½	7	12	Nil	
	Do. ..	—	—	—	—	—	—	—	—	—	Dfd.	9	3¼	6¼	Nil	
	Cent. Uruguay of M. Video ..	273	29.2.36	11,847	1,507	35	373,241	509,704	—	136,463	Ord. Stk.	81½	3	7	Nil	
	Do. Eastern Extn. ..	311	29.2.36	2,578	324	35	69,116	66,241	+	2,875	"	—	—	—	—	
	Do. Northern Extn. ..	185	29.2.36	1,498	144	35	48,635	35,991	+	12,644	"	—	—	—	—	
	Do. Western Extn. ..	211	29.2.36	984	158	35	30,698	28,171	+	2,527	"	—	—	—	—	
	Cordoba Central ..	1,218	7.3.36	23,560	1,220	36	1,034,790	1,033,730	—	1,060	Ord. Inc.	4	1	2½	Nil	
	Costa Rica ..	188	Dec., 1935	12,022	6,024	26	80,721	99,051	—	18,330	Stk.	35	30	35	51½	
	Dorada ..	70	Jan., 1936	13,360	2,896	5	13,360	10,500	+	2,890	1 Mt. Db.	105½	102½	104½	5½	
	Entre Rios ..	810	7.3.36	9,624	79	36	398,738	451,609	—	52,871	Ord. Stk.	15	6½	10	Nil	
	Great Western of Brazil ..	1,082	7.3.36	9,800	1,100	10	98,900	110,000	—	11,100	Ord. Sh.	12	3½	12	Nil	
	International of Cl. Amer.	794	Jan., 1936	850,154	\$72,063	8	\$501,540	\$429,477	+	\$72,063	"	—	—	—	—	
	Interoceanic of Mexico ..	—	—	—	—	—	—	—	—	—	1st Pref.	12	5½	12	Nil	
La Guaira & Caracas ..	22½	Feb., 1936	4,225	825	9	8,650	6,500	+	2,150	Stk.	81½	8	81½	Nil		
Leopoldina ..	1,918	7.3.36	16,271	290	10	180,527	170,884	+	9,643	Ord. Stk.	81½	21½	7	Nil		
Mexican ..	483	7.3.36	\$256,100	\$23,800	10	\$2,407,700	\$2,222,600	+	\$185,100	"	11½	14	1	Nil		
Midland of Uruguay ..	319	Jan., 1936	9,440	3,842	31	48,136	79,115	—	30,979	"	11½	11½	11½	Nil		
Nitrate ..	401	29.2.36	5,893	1,279	9	29,354	28,345	+	3,009	Ord. Sh.	64½	42½	2½	Nil		
Paraguay Central ..	274	29.2.36	\$2,344,000	\$1,103,000	35	\$72,406,000	\$36,378,000	+	\$36,028,000	Pr. Li. Stk.	80½	60	77	71½		
Peruvian Corporation ..	1,059	Feb., 1936	78,640	15,819	35	616,056	499,646	+	116,410	Pref.	105½	67½	13½	Nil		
Salvador ..	100	29.2.36	\$31,700	\$3,000	35	\$611,596	\$657,102	—	\$45,506	Pr. Li.Db.	65	61	65	71½		
San Paulo ..	153½	1.3.36	22,344	2,343	9	232,334	193,161	+	39,174	Ord. Stk.	80	35	61½	41½		
Taital ..	164	Feb., 1936	4,570	695	35	28,485	22,707	+	5,778	Ord. Sh.	111½	11½	11½	71½		
United of Havana ..	1,353	7.3.36	45,554	6,795	36	736,348	774,414	—	38,066	Ord. Stk.	31½	1	3	Nil		
Uruguay Northern ..	73	Jan., 1936	841	311	31	5,560	8,446	—	2,886	Deb. Stk.	41½	21½	41½	Nil		
Canada.	Canadian National ..	23,684	29.2.36	777,392	122,270	9	5,161,812	4,906,824	+	254,988	—	—	—	—	—	
	Canadian Northern ..	—	—	—	—	—	—	—	—	4 p.c.	Perp. Dbs.	78½	52½	69	51½	
	Grand Trunk ..	—	—	—	—	—	—	—	—	103½	4 p.c. Gar.	103½	93	103½	37½	
	Canadian Pacific ..	17,260	29.2.36	545,000	115,400	9	3,720,800	3,384,600	+	336,200	Ord. Stk.	141½	84	131½	Nil	
India.	Assam Bengal ..	1,329	2.2.36	37,845	5,008	46	1,125,033	1,276,518	—	151,485	Ord. Stk.	92½	77½	88½	31½	
	Baird Light ..	202	10.2.36	4,890	1,538	45	123,787	121,492	+	2,295	Ord. Sh.	105	121	77½	73½	61½
	Bengal & North Western ..	2,112	2.2.36	91,303	6,795	46	1,061,027	1,055,631	+	5,396	Ord. Stk.	301½	291	304½	51½	
	Bengal Doars & Extension ..	161	10.2.36	3,346	270	45	1,21,615	137,172	—	15,557	"	127½	122	122½	51½	
	Bengal-Nagpur ..	3,268	31.1.36	205,350	4,944	43	5,321,179	4,922,786	+	398,393	"	105	100½	102½	37½	
	Bombay, Baroda & Cl. India ..	3,072	29.2.36	252,150	53,775	48	7,528,300	7,569,600	—	41,250	"	115½	110	112½	51½	
	Madras & Southern Mahratta ..	3,230	10.2.36	155,325	1,895	45	4,602,546	4,799,378	—	196,832	"	128½	113½	115½	7½	
	Rohilkund & Kumaon ..	572	2.2.36	19,278	291	46	207,770	208,783	—	1,013	"	294	262	300½	51½	
South India ..	2,526	10.2.36	108,648	15,986	45	3,988,992	3,576,547	—	187,553	"	119½	104½	106½	71½		
Various.	Beira-Umtali ..	204	Dec., 1935	63,267	7,772	13	193,193	180,985	+	12,208	—	—	—	—	—	
	Bilbao River & Cantabrian ..	15	Feb., 1936	2,152	91	9	3,469	4,310	—	841	—	—	—	—	—	
	Egyptian Delta ..	622	20.2.36	6,633	36	46	226,345	216,962	+	9,383	Prf. Sh.	2	15½	1½	51½	
	Great Southern of Spain ..	104	29.2.36	1,535	228	9	10,942	17,503	—	6,561	Inc. Deb.	31½	2	3½	Nil	
	Kenya & Uganda ..	1,625	Nov., 1935	132,196	11,855	48	2,184,339	2,030,213	+	154,126	"	—	—	—	—	
	Manila ..	—	—	—	—	—	—	—	—	—	B. Deb.	48	36	47½	7½	
	Mashonaland ..	913	Dec., 1935	99,331	10,413	13	313,033	342,255	—	29,222	1 Mg. Db.	104½	100	104½	4½	
	Midland of W. Australia ..	277	Jan., 1936	14,828	1,651	31	98,451	92,125	+	6,326	Inc. Deb.	98½	93	94½	51½	
	Nigerian ..	1,905	18.1.36	54,944	1,254	42	1,468,902	1,564,546	—	95,644	"	—	—	—	—	
	Rhodesia ..	1,538	Dec., 1935	185,464	3,848	13	575,986	556,632	+	19,334	4 p.c. Db.	105½	101	105	31½	
	South African ..	13,246	15.2.36	597,693	72,881	46	26,247,639	23,737,961	+	2,549,678	"	—	—	—	—	
	Victoria ..	4,728	Nov., 1935	823,035	25,801	21	3,959,297	3,881,659	+	77,638	"	—	—	—	—	
Zafra & Huelva ..	112	Jan., 1936	10,488	895	5	10,488	11,383	—	895	"	—	—	—	—		

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1½.

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador and Paraguay Central receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rates of exchange and not on the par value.